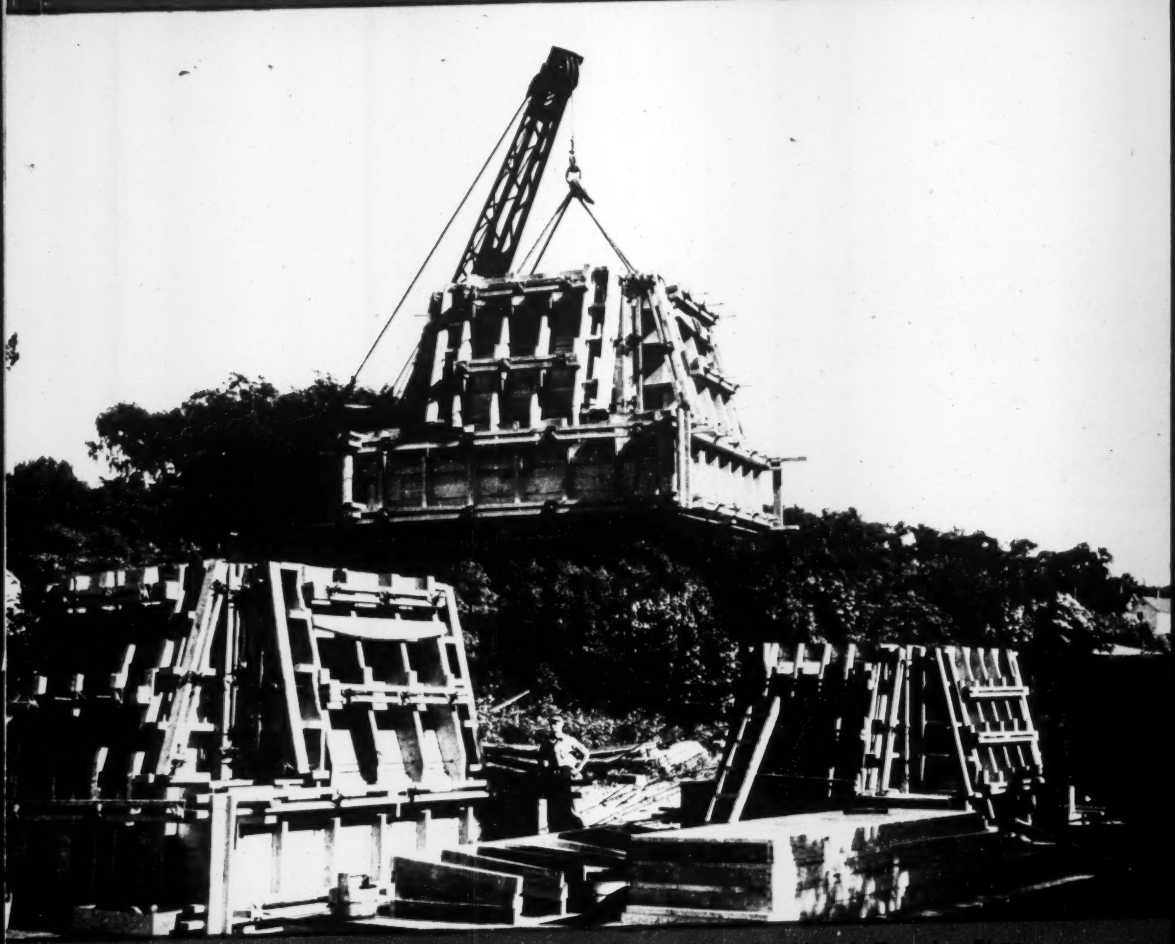
ENGINEERING NEWS-RECORD

JUNE 23, 1949

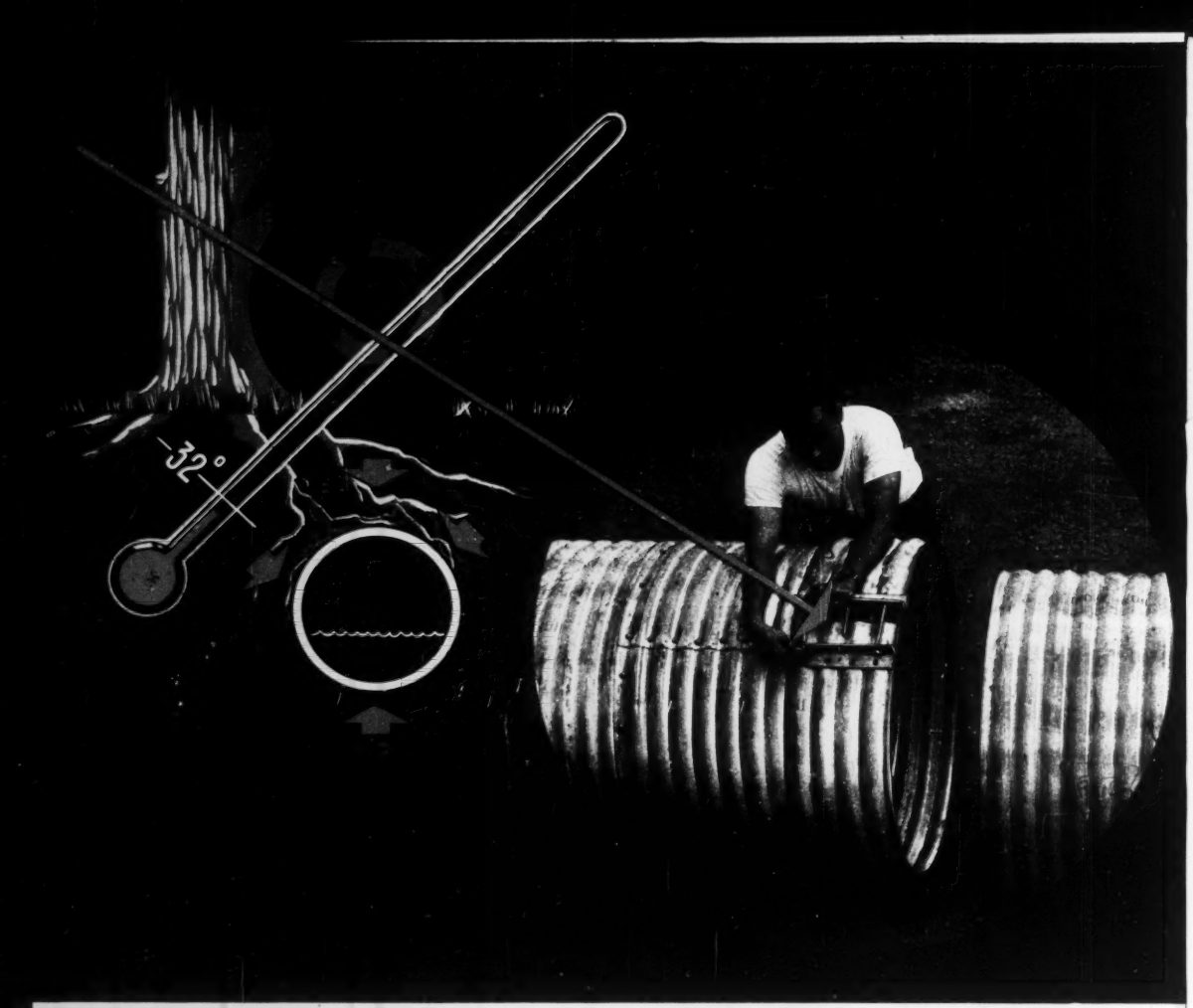


Forms are placed for reinforced concrete piers of bridge across Maine's Kennebec River

BIG BULL SHOALS CALLS FOR BIG EQUIPMENT

INDUSTRIAL FOUNDATIONS BUILT ON SAND

A McGRAW-HILL PUBLICATION



This drainage pipe has good connections

Here's one drainage pipe that knows the right people. Long ago Armco engineers decided that nothing was going to push this pipe around.

They considered the impact and vibration of heavy traffic, shifting soils, frost action, unstable foundations and other hazards. Then Armco engineers carefully designed a connecting band that makes each joint as strong as the rest of the pipe. The result is a product that can be installed with complete confidence in its continuing efficiency as a conduit. No danger of mal-alignment. No open joints to invite tree roots or clogging from silt. Armco Corrugated Metal Pipe has proved ideal for sewers, culverts and similar drainage structures.

Providing better products to meet specific needs has been standard practice at Armco for more than 40 years. A few examples are FLEX-BEAM Guardrail, Spiral Welded Pipe, STEELOX Buildings, PIPE-ARCH and sturdy MULTI-PLATE Bridges.

Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

Armco has a complete range of engineered products and convenient authoritative data to help you. If your problem is difficult or unusual why not talk it over with us?

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Tires with double bruise protection slash tire costs as much as 50%

THE B. F. Goodrich *Universal* tires shown above have been in daily *quarry service* for over 21 months! They're still going strong and are in good condition, as the picture shows. Another operator reports over 4500 service hours from Universals against only 1600 hours from another make used in identical service.

Such comparisons help point out the great difference between various makes of off-the-road tires. When *results* are measured, B. F. Goodrich tires always stand out. But there's no mystery to it. There are several reasons for the consistent top performance of BFG tires. Notice the tread on the tires in the picture. It's designed to give traction both ways. More than that, it is made of specially compounded, cut-resistant rubber . . . armor against sharp rocks and a score of other off-road tire killers.

Also, BFG tires have double bruise protection in the form of a *double nylon shock shield*. The nylon shock shield consists of layers of nylon cord built between the tread and the body plies. Under load and under impact, the strong, elastic nylon shields the rayon cord body . . . and there are *two* such shields for *double* protection!

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ENGINEERING NEWS-RECORD

VOLUME 142 JUNE 23, 1949 NO. 25

WALDO G. BOWMAN
Editor

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Number of copies.....44,549

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Domestic News Bureaus—Atlanta, Chicago, Cleveland, Detroit, Houston, Los Angeles, San Francisco, Washington. Correspondents in 71 cities in the United States, Canada and Mexico.

Foreign News Bureaus—London, Frankfort, Paris, Moscow, Tokyo, Bombay, Melbourne, Rio de Janeiro, Mexico City. *Correspondents*—Athens, Rome, Caracas, Buenos Aires, Santiago, Shanghai, Zurich, Johannesburg and 40 other cities.

ROBERT F. BOGER
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June 23, 1949 ENGINEERING NEWS-RECORD Vol. 142 No. 25

Publication Office—99-129 N. Broadway, Albany 1, N. Y.
Executive and Editorial Offices—330 West 42nd St., New York 18, N. Y.
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Subscriptions: (1 yr., 2 yr., 3 yr.) U. S. and possessions, $6, $9, $12; Pan America, $10, $16, $20; Canada $7, $11, $14; All others, $20, $30, $40.

Address all communications about subscriptions to Director of Circulation. Price 35¢ per copy.

Please indicate position and company connection on all subscription orders.

Entered as Second Class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of March 3, 1879. Printed in U. S. A.

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about ROCK

10

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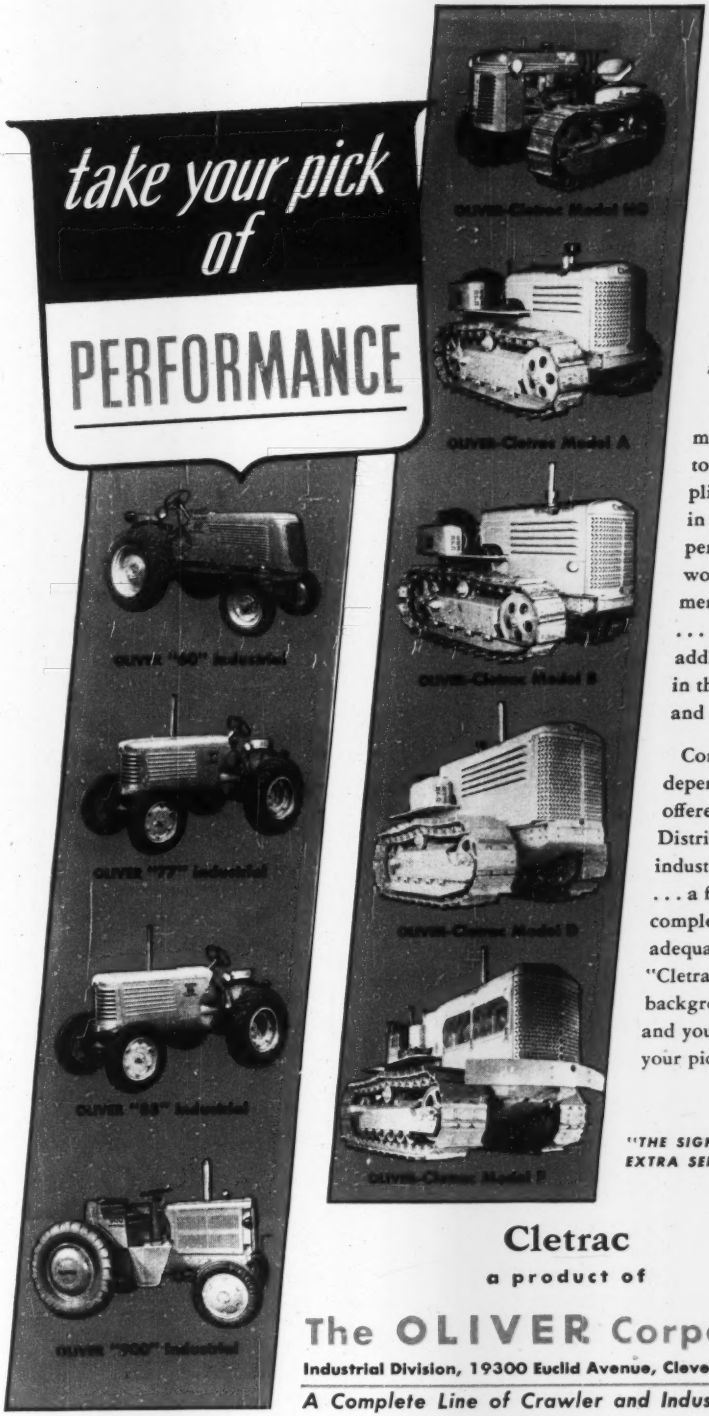

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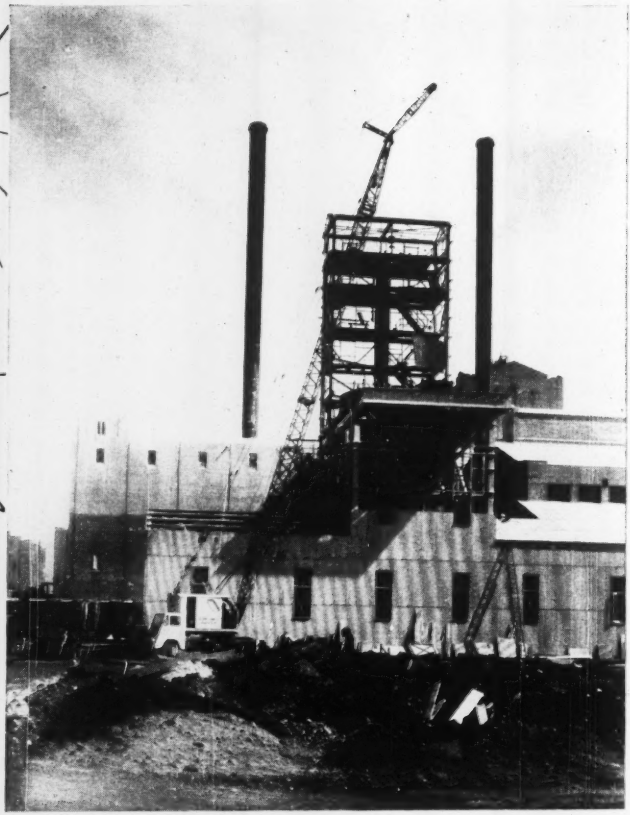

IT'S EASY WHEN YOU'VE GOT THE REACH

Getting all kinds of materials "up in the air" quickly and easily is no trick at all when you have a BAY CITY CraneMobile on the job. This Model 180, working for Detroit Crane Co., has a 100′ boom, 15′ job, and with a 20 ton rated capacity *can do everything from setting steel to handling concrete* on this new building project. When working in tight quarters and congested areas, operators like CraneMobile's quick, responsive swing and booster type clutches that *mean smooth, positive operation at all times.* Big capacity, long booms, and plenty of power make CraneMobile your best buy. Write for facts on this versatile performer.

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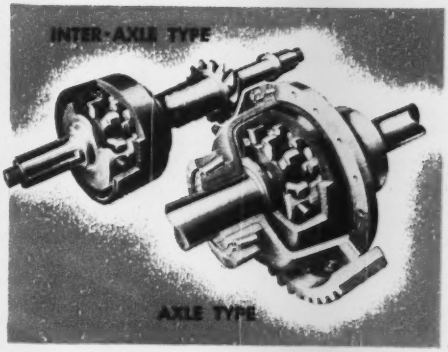
◆ Trucks that stick in the mud are an expensive proposition when you're trying to get the big loads out on stepped-up schedules. When they bog down, profits go right down with them.

Masters of the mire, Mack six-wheelers keep going through slippery mud and sand because they have the benefit of Mack's exclusive Power Divider. This unique device divides torque between the two bogie axles and between the four driving wheels. Torque is delivered proportionately to wheels having the most traction, thus eliminating dissipation of power in useless slippage and wasteful wheel spinning.

If "stick-in-the-muds" are holding you back, it will pay you to investigate the profit possibilities of dependable, hard-working Mack trucks. Write or call your nearest Mack branch or dealer for the complete story on what Macks can do for you.



it's a job for MACK TRUCKS

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Built Like a **Mack** *Truck*

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Limited.

Land clearing—or any 'dozer work—is a pushover for International Diesel Crawlers. International diesels have the power and stamina to ram jobs through to completion at low cost and in minimum time.

International Power, geared to the ground by earth-grabbing tracks, puts maximum pull or push into the work for efficient earthmoving.

Get these International diesel advantages: advanced design fuel combustion, simplified fuel injection, positive all-weather starting, sensitive speed governing with torque control that increases engine torque as much as 15% when the load demands it, and the many other operating and construction features which International crawlers provide. They assure *superior performance, matchless operating economy* and *low maintenance;* benefits which spell PROFITS for International owners everywhere.

See *your* International Industrial Power Distributor or write for folder describing the International TD-18 Diesel Crawler.

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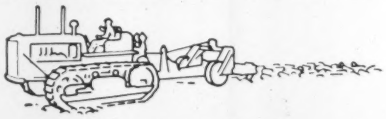

The International TD-18 Diesel Crawler, below, with matched bulldozer, clears stumps from land for a Seattle suburb. Its owner, W. H. Kamp of Des Moines, Washington, has worked this tractor for 4½ years without any trouble or repairs. It puts in seven day weeks of 24-hour days at long stretches. It has built as much as 7,000 feet of streets in twenty days, including opening and clearing land during extremely wet conditions, removing rocks as large as five tons and stumps of 10-ft. diameter. "The tractor is just as true today as a new machine," he says, "not sprung in the least and has never been off the tracks!" Quite a record for more than 10,000 hours of operation!

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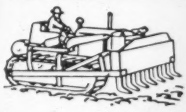
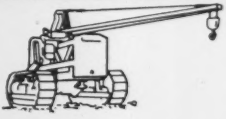
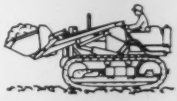
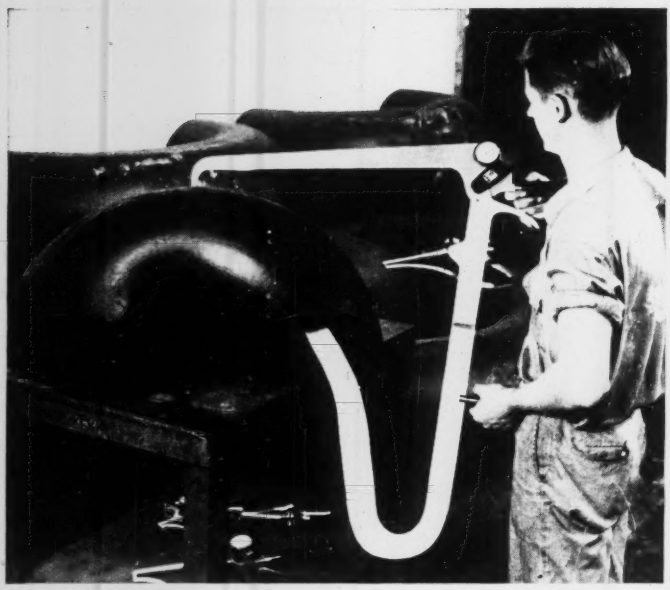
INDUSTRIAL POWER









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THE wall thickness of Tube-Turn welding fittings simply has to be right. Every single Tube-Turn welding fitting is micrometer-checked before being put on the market.

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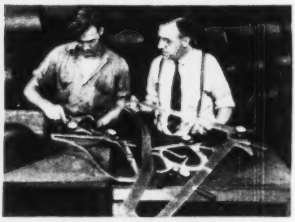
This micrometer check for dimensional accuracy is a small part of the thorough scrutiny to which the finished Tube-Turn product is subjected.

More than thirty skilled inspectors check for true circularity, accurate center-to-face dimensions, uniformity of curvatures, soundness of outside and inside surfaces, wall thickness of butt ends, bevels, lands, and quality of machining.

And that's just a fraction of the total *care* involved in the manufacture of Tube-Turn welding fittings.

Perfection begins with the raw material which is checked for conformity to required chemical composition and physical properties. It must pass all pre-determined requirements before acceptance for production of Tube-Turn welding fittings. Special materials, of course, undergo special tests.

When you buy "Tube-Turn" you want good connections. That's what you get, every time.



Five different-size gauges of exclusive design are used to check the wall thickness of every Tube-Turn welding fitting.

While one inspector checks the diameter of a 90° elbow, the other checks on perfection of inner wall.

Inspectors check the center-to-face dimension of a 20"-90° Tube-Turn welding elbow.

A part of the final inspection department. Here, Tube-Turn welding fittings undergo intensive instrumental and visual inspection.

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Pictured above is Raymond's 1200-pile foundation for the new Caterpillar Tractor Company Building LL at Peoria, Ill.

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Hyatt invented the roller bearing fifty-seven years ago.

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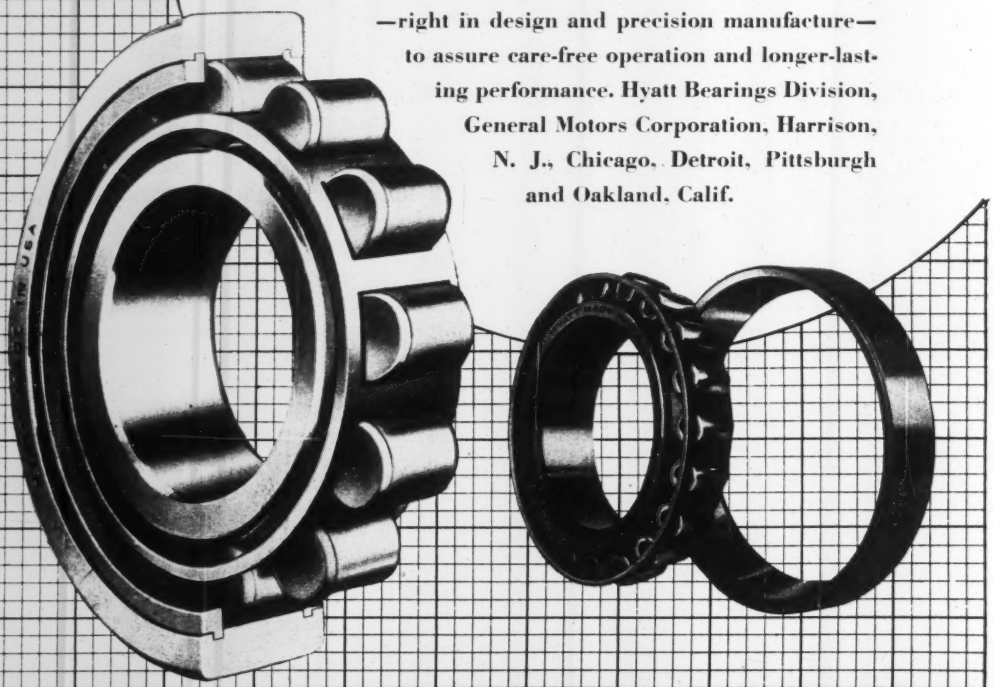

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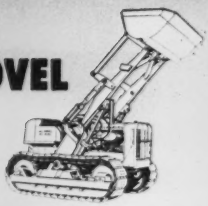

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- NOTE—Interchangeable buckets and other accessories

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- Weight 8,000 lbs.
- Major tractor components — Allis-Chalmers
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★ ★

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★ REINFORCED CONCRETE SUBAQUEOUS PIPE ★

★ ★

Whatever your water supply line problem may be, one of these four standard Lock Joint designs is certain to satisfy your requirements and give lasting service.

Made in all standard diameters from 16" to 150", Lock Joint Pressure Pipe is designed for all pressures common to American water works practice.

You are invited to inquire at any of our offices for complete information.

SCOPE OF SERVICES.—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

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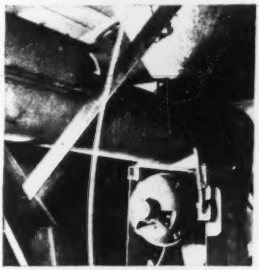
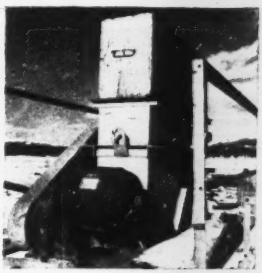
LOCK JOINT *Reinforced Concrete* PRESSURE PIPE

automatic batching ...Electrically



Cement from silo is fed to weigh batcher by worm screw, driven by G-E Tri-Clad motor.

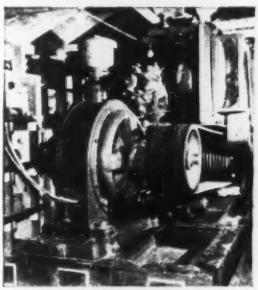


Cement elevator drive is powered by G-E Tri-Clad motor.

G-E Motors and Control Speed Concrete Placing at Granby

Granby pumping plant, operating heart of the Bureau of Reclamation's Colorado Big Thompson project, is now under construction at an accelerated pace. To help maintain this pace, Granby Constructors are utilizing electric drive wherever possible as on this Noble batch plant . . . relying on General Electric components almost entirely.

Construction equipment driven by G-E motors and control, supplied from G-E Power-distribution systems, will help you meet schedules . . . at a profit! Apparatus Dept., General Electric Co., Schenectady, N. Y.



G-E induction motor driving compressor which supplies air to batch plant and other equipment.

Bert Sandberg, Engineer for Granby Constructors, operates the G-E combination starter which controls the compressor motor.

Ask him Today!

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job at lower cost by complete electrification. Call, wire or write him now!

Electrified Construction
BETTER PRODUCT
LOWER COST

GENERAL ELECTRIC

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for faster sawing

New CP HI-SPEED UNIVERSAL ELECTRIC SAW cuts 25% to 40% faster. Blades available for cutting through nails, copper, brass, bronze, lead, tile, glass, brick, clay products, concrete, marble, flagstone, asbestos, cement products and composition board. Write for SP-3000.

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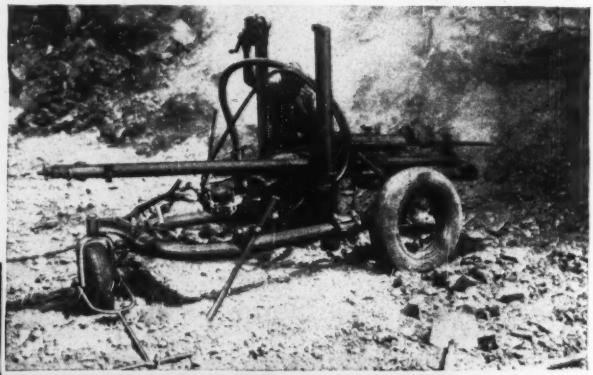
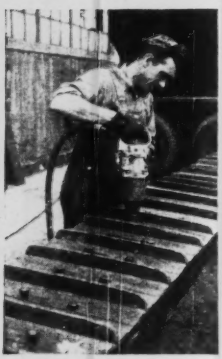
Drills horizontally, vertically, or at any angle. Readily moved over uneven ground, the lightweight G-200R WAGON DRILL provides fast and easy operation of the more powerful CP drifter drills. Quickly adjustable for toe-hole or bench drilling. Available with CP-50N (3″), CP-60N (3½″), or CP-70 (4″) Drifters. Write for complete information.

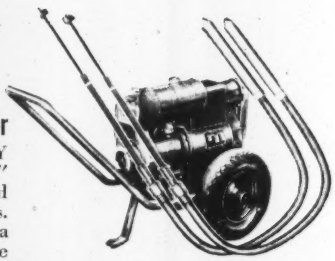


4 time-savers that cut contractors' costs



for the tough jobs

Heavy-duty CP Air Impact Wrench easily runs off — or on — nuts up to 1¼″ bolt size. For maintenance as well as construction work: just the wrench for tractor treads and similar heavy servicing jobs. Write for Bulletin 812.



for vibrating concretes of 2″ slump and over

Portable CP-220 HIGH FREQUENCY ELECTRIC VIBRATOR for concretes of 2″ slump and over; for walls, columns, floor and roof slabs, precast piles and similar products. Two of these vibrators can be powered by a CP-2KW Gasoline-driven Generator. Write for Bulletin 814.

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General Offices: 8 East 44th Street, New York 17, N. Y.

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Lower your Costs

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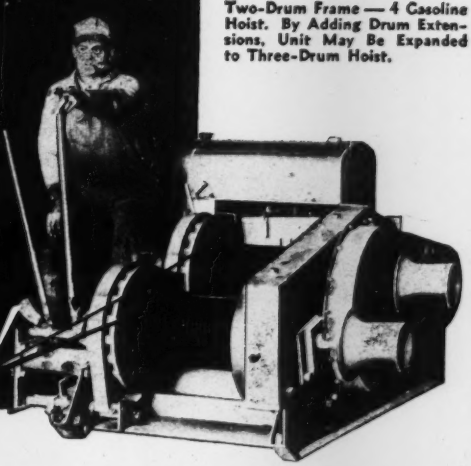


Two-Drum Frame — 4 Gasoline Hoist. By Adding Drum Extensions, Unit May Be Expanded to Three-Drum Hoist.

ENGINEERED FOR LONG-LIFE DEPENDABILITY

The smoother, easier operation of Clyde Hoists assures **faster, more careful** material handling on construction jobs.

Clyde "quality-plus" Frame-4 Hoists are engineered for maximum efficiency and long-life performance that is unexcelled! All shafts are of high carbon steel and turn on ball bearings. All steel, electric welded frame is of exceptional strength and rigidity but free of unnecessary bulk and weight. And here is another "plus" value that owners and operators appreciate: — at those infrequent intervals when a Clyde Hoist requires maintenance, the easy accessibility and simplified servicing saves time and encourages the operator to keep the hoist in top operating condition.

Whether your requirements call for a one, two or three drum hoist powered by gasoline, electric or diesel unit, it will pay **you** to investigate the complete line of Clyde "quality-plus" Frame-4 Hoists.

OUTSTANDING FEATURES

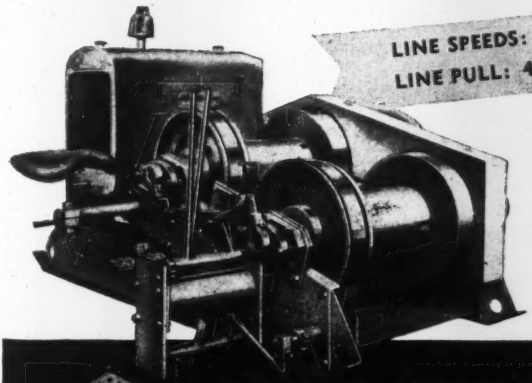
THRUSTS AND FRICTIONS:
Thrusts are full ball bearing screw and yoke type, easily engaged and released. Efficient, simplified cone frictions require minimum care and adjustments.

RATCHETS:
Rugged, positive action rachets are cast on drums. Pawls are visible to the operator for greater safety.

DRIVE:
Chain drive operates in oil bath. Chain adjustments are easily made by means of a new type tightening mechanism. All shafts turn on ball bearings..

DRUMS:
Barrel diameters are of most practical size for the utmost rope economy. Drums are one piece with self-oiling bushings.

POWER:
Choice of gasoline, electric or Diesel.



LINE SPEEDS: 178 to 332 feet per minute

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EXTRA VALUE in BUCYRUS ERIE Design!

There's good reason for the outstanding work records set by Bucyrus-Erie dipper dredges over the years. It's the "extra value" in Bucyrus-Erie's ability to design and build efficient dredges for continuous service even under adverse operating conditions — the result of over 65 years of successful experience in this specialized manufacturing field.

Our engineers recognize the fact that high overall efficiency demands more than mere digging efficiency — it demands proper coordination of the functions of all dredge units. Every Bucyrus-Erie dipper dredge is painstakingly designed for the specific type of work it is to handle, to produce sustained high output at lowest operating cost. And careful attention to the smallest details of design, coupled with Bucyrus-Erie's unmatched experience and manufacturing facilities, is your assurance of a top-quality machine, *years ahead* in design, and built for many years of outstanding performance.

BUCYRUS-ERIE CO.

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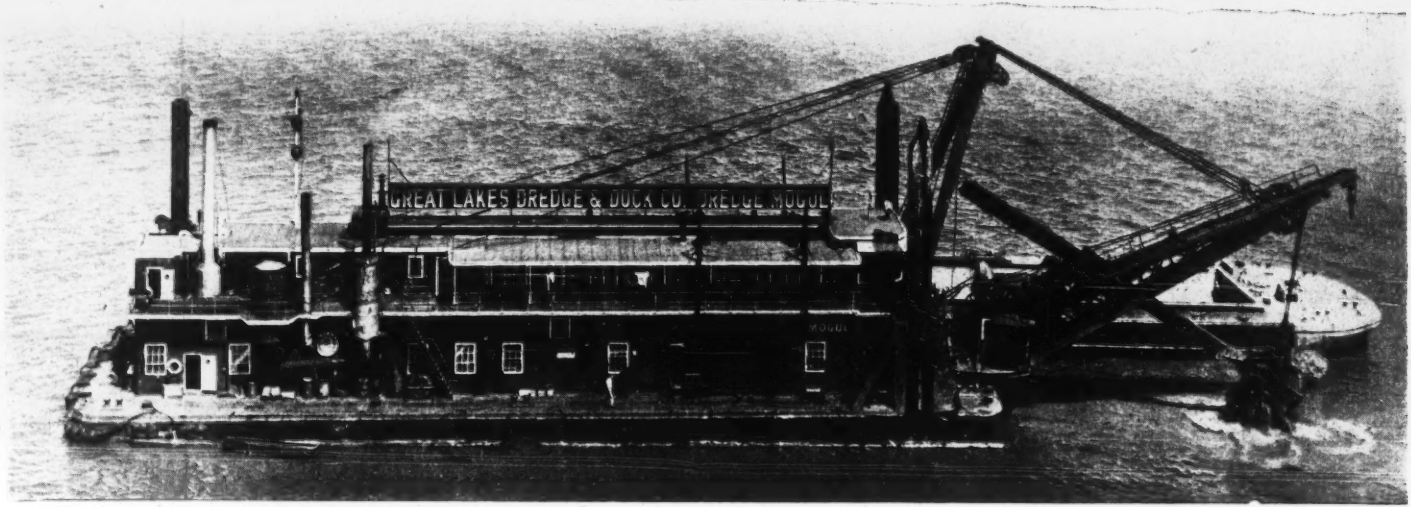
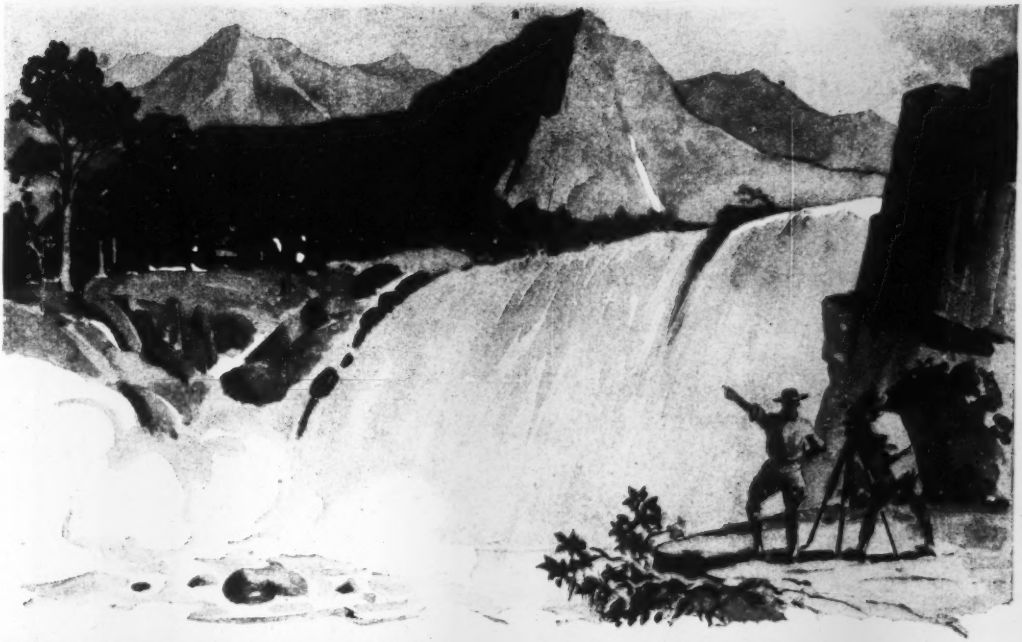
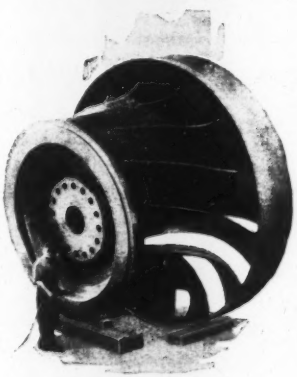




HARNESSING WATER-
A Source of Natural Energy-



SURGING, irresistible water . . . Sweeping through rapids and roaring over the cataract's crest . . . An inextinguishable source of power—tamed and subjugated in the service of man!

Nothing in the mythical accomplishments of the alchemist of old, who by sorcery changed lead into gold, surpasses in magic the conversion of the power of falling water into electrical energy by Smith-made water power machinery.

More than 75 years, devoted exclusively to the building of hydraulic equipment — including turbines alone of more than 12,000,000 horsepower capacity—are your assurance of maximum power results, when you place your problem in our hands!

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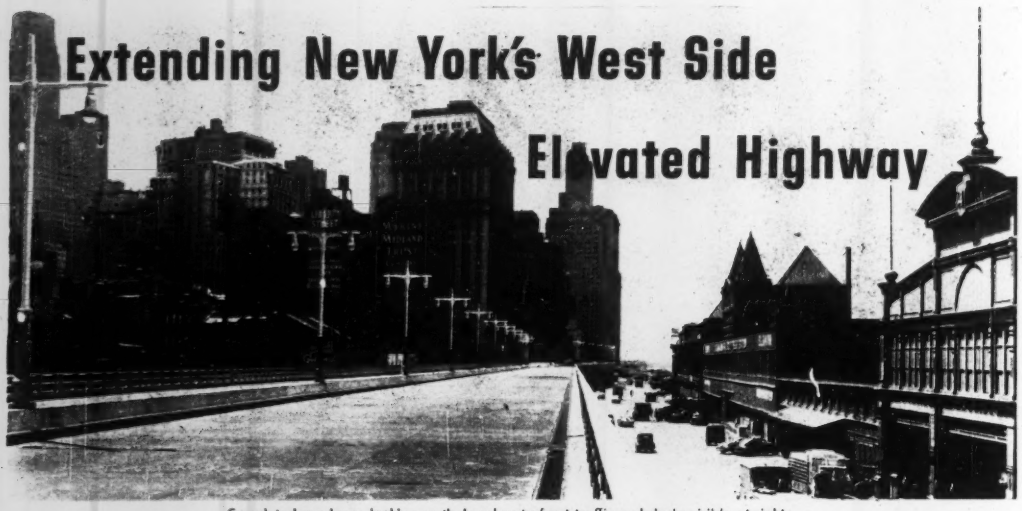
POWER by SMITH

Extending New York's West Side Elevated Highway



Completed roadway, looking south. Local waterfront traffic and docks visible at right.

Huge 44-ton girder, fabricated by Bethlehem, is slowly wheeled into place. Bethlehem fabricated and erected 2552 tons of structural steel for the West Side Highway extension.

Henry Levinson (center), Section Engineer, Office of President, Borough of Manhattan, with Eric Nelson (left), General Superintendent, and A. J. Linsky, President, Lynn Construction Co.

Street-level view, showing steelwork completed. Local traffic was maintained while overhead construction was in progress.

In order to provide a direct, high-speed approach to the new Brooklyn-Battery Tunnel, the Borough of Manhattan of the City of New York recently extended the lower end of its heavily-traveled West Side Elevated Highway. These scenes were taken on a 1217-ft stretch of the new four-lane road, between Duane and Barclay Sts. Contractor: Lynn Construction Co., Inc., New York. Structural steel fabricated and erected, and reinforcing bars supplied by Bethlehem.

Tying Bethlehem Reinforcing Bars, prior to pouring concrete. Bethlehem Reinforcing Bars used in this project totaled 350 tons.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
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STEEL FOR HIGHWAYS

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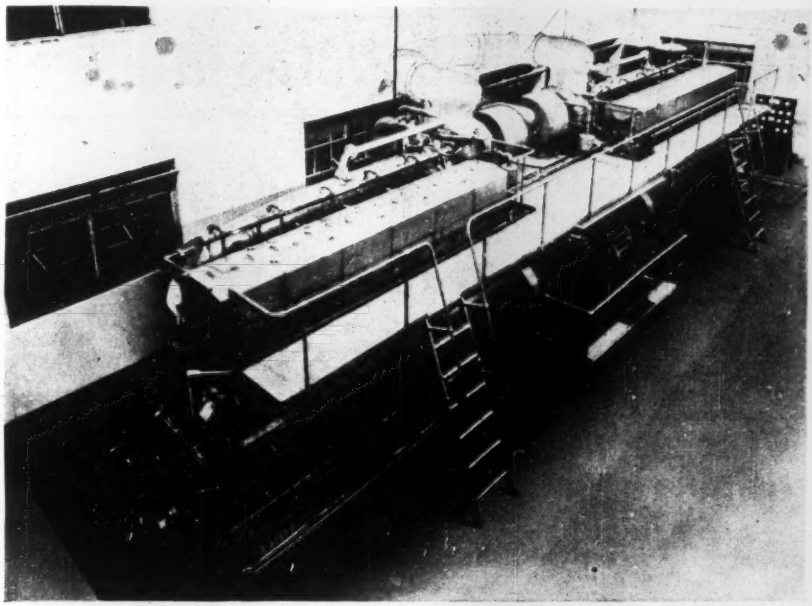
BETHLEHEM STEEL

NEWS

FROM THE PUBLIC WORKS FRONT



Worthington 16 X 20 SEHPG Twin 6 gas Diesel engine in municipal power plant at Lafayette, La.

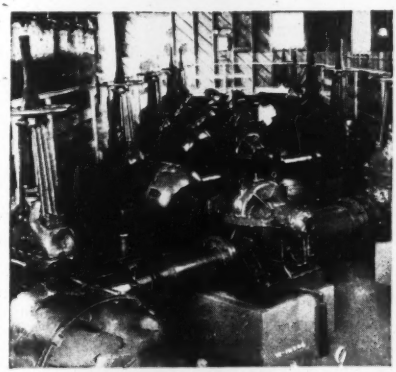
Fueling a Diesel with Gas Saves $5000 a Month

Because natural gas is readily available at Lafayette, Louisiana, the municipal power plant there uses it to fuel its Worthington gas Diesel engine. R. P. Hebert, the chief engineer, says: "Our actual cost of generating power with our Worthington gas Diesel is 2 mils per KW hour. Fuel oil costs 9 mils per KW hour, so we figure that we are actually saving about $5,000 a month by running our Diesel with gas."

But that is not the only saving with Worthington. Mr. Hebert reports: "Next to the low fuel cost of the Worthington gas Diesel, the most remarkable thing about the Worthington engine is its low lube oil consumption. Worthington estimates 4,000 BHP per hour for each gallon of lube oil consumed. Actually, we are getting about 10,000 BHP per gallon."

Maintenance cost is also low. "Maintenance cost on the Worthington Diesel has been low and operation steady. We have been operating the engine at a steady clip. In July, for example, she has operated for 714 out of 744 possible hours."

5 Wartimers Pump 29,160,000,000 Gallons Without Repairs or Shutdowns



Six Worthington pumps and motors in the Lower Otay Pumping Plant, San Diego, Calif.

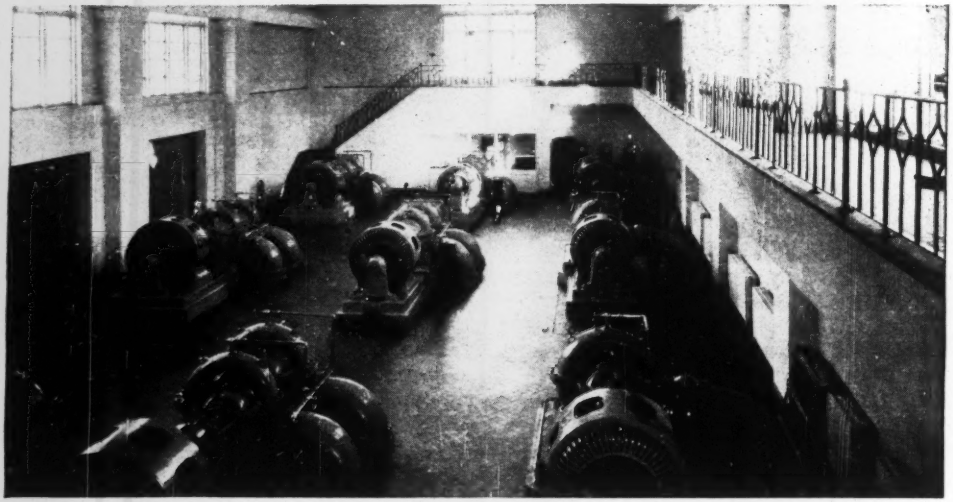
To increase the water draft on the Otay-San Diego Main Pipe Line, the city of San Diego found it necessary in 1945 to install a booster pumping plant and thus increase the flow from 18 mgd to 27 mgd.

Six Worthington 10" Type LA pumps, driven by 150 hp motors, each unit rated at 5.4 MGD, were placed in operation on July 11, 1945. Five of the pumps are in operation at any one time. The plant has pumped about 27 mgd for a period of 3 years, or a total of 29,160,000,000 gallons, practically without interruption, and without any repairs or material shutdowns.

Mr. Fred D. Pyle, Hydraulic Engineer of this plant, writes, "The pumps and motors have performed in a most satisfactory manner, and are a credit to your company."

WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.

Virtually a "Clean Sweep" for Worthington in Washington, D. C.



Worthington centrifugal pumps at New Jersey Avenue main sewage pumping station, Washington, D. C.

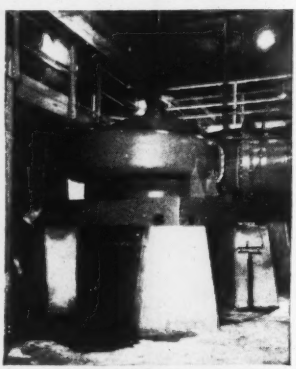
In the District of Columbia practically all of the water flows from source to disposal under the impulse of Worthington.

Drinking water furnished by the Washington Aqueduct, water supply system to the city, is taken from the Potomac River just above Great Falls. It is treated and pumped in part by the Dalecarlia Pumping Station, at the city's western boundary, directly to the District of Columbia distribution mains or to other pumping stations.

Originally there were nine Worthington filtered water pumps installed at Dalecarlia Pumping Station. One of these on being replaced by a larger unit was reinstalled as an emergency booster in the Anacostia area during the war.

The four Sanitary and six Storm Water Pumping Units at the New Jersey Avenue Pumping Station are Worthington-Electric Machinery. Some years ago, when the old steam-driven vertical centrifugals of another make were to be replaced, the contract was given to Suburban Engineering Company of New York whose low bid was based on furnishing Worthington-Electric Machinery units.

From New Jersey Avenue, sewage is pumped to the District's Sewage Treatment Plant at Blue Plains, D. C., where the four main pumps and motors are Worthington-Electric Machinery. From Blue Plains the effluent is returned to the Potomac—thus completing the cycle over which Worthington is encountered every step of the way.



One of four Worthington centrifugal pumps at Blue Plains Sewage Treatment Plant, Washington, D. C.

The District's pumping station at Bryant Street is scheduled to be completely rehabilitated and in connection with this modernization, Worthington has been awarded the contract for ten Worthington-Electric Machinery pumping units.

The Dalecarlia Pumping Station also supplies all the public water used by Arlington County, Virginia, where it is pumped into the distribution mains by three Worthington pumps.

Worthington also has tens of thousands of water meters in the District of Columbia measuring the water pumped by Worthington pumps.

The total capacity of Worthington pumps in service and under contract for the District of Columbia water, sanitary, storm water and sewage treatment systems is **1,424,000,000 gallons per day.**

Worthington Pump and Machinery Corporation
Harrison, N. J.

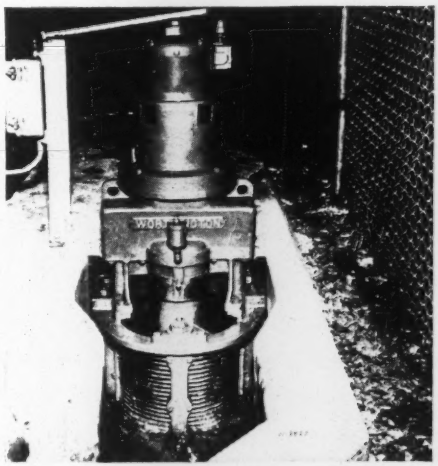
NEWS

The Comminutor

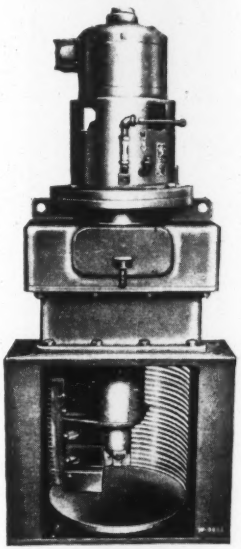
The modern trend toward complete mechanization of sewage treatment plants is marked by the development of the comminutor, the device which screens out large solids in raw sewage and reduces them to a selected working size that will pass through a fine screen without later clogging mechanical equipment.

Comminutors of the type manufactured by Worthington are so designed that they will operate completely automatically, thereby eliminating the undesirable task of screening and disposal. Unsightly solids and offensive odors, usually connected with sewage treatment, can be made annoyances of the past.

Comminutors are generally used as a preliminary to treatment processes. Comminution is best performed by setting the sewage machine in a channel preferably after a grit chamber and preceding a primary settling tank. The comminutor may also be located so as to discharge into a wet well and, if necessary, the motor can be mounted above a possible flood elevation and intermediate shafting employed.



Worthington Comminutor (downstream view) installed in Essex Fells Sewage Treatment Plant, New Jersey.



Worthington Comminutor, upstream view.

The Worthington comminutor is installed in existing or new straight sewage channels in single or multiple units, requiring no special channel design. Since the raw sewage is permitted to flow straight through the screen, installation problems have been simplified and cost minimized.

It consists of a compact, vertical unit comprising a screen, a mechanism for comminuting the screenings, and an electric motor. Only two racks of cutters are employed to simplify occasional sharpening or replacement.

The vertical, semi-circular, stainless steel screen retains all the coarse matter too large to pass through its horizontal 5/16 inch wide slots. An oscillating arm fitted with a rack of stainless steel cutters collects the screenings momentarily accumulated on the screen's inner surface as it moves back and forth through an angle somewhat less than 180 degrees.

Centrally located at the screen is a vertical, stainless steel stationary cutter. Since the teeth on the oscillating cutter pass through the teeth on the stationary cutter as the arm oscillates back and forth, comminution is performed when the solids are engaged between the two. A gradual cutting and shredding action is assured for the oscillating cutter is at an angle relative to the stationary cutter.

The small, vertical electric motor, usually directly mounted on the comminutor, drives the oscillating arm through a Scotch Yoke mechanism, which converts rotary motion into oscillating motion. The speed of the motor is reduced by means of a planetary gear, an integral part of the motor.

The effluent from the comminutor contains cut and shredded solids that have been screened, hence are of a workable size that settles rapidly, less likely to cause large amounts of scum, and do not clog mechanical equipment. Comminution is performed rapidly, continuously, and automatically; consequently the need for screening disposal has been eliminated and sludge digestion improve.

Utmost Structural Stability and Fire-Safety

IN HOUSTON'S PALATIAL NEW HOTEL

NATIONWIDE interest in The Shamrock, largest hotel built since the war, naturally dwells on deluxe decor and distinguished service. But the structure itself is as sound of heart and sinew as modern building methods can make it: Strong, durable concrete throughout . . . fireproof of itself . . . *quality* concrete, every cubic yard, with mixes carefully designed to produce the full potential of strength and durability provided by cement itself of highest quality. As in New York's Waldorf-Astoria, Lone Star Cement was used exclusively in The Shamrock—a total of 50,000 bbls.

Lone Star Cements meet every construction need: LONE STAR PORTLAND CEMENT, for outstanding performance in all types of construction . . . 'INCOR'* 24-HOUR CEMENT, where dependable high early strength cuts time, form and winter costs . . . LONE STAR AIR-ENTRAINING CEMENT for highway work and many other uses . . . LONE STAR MASONRY CEMENT for quality masonry. There is added assurance in the unvarying quality of Lone Star Cements.

*Reg. U. S. Pat. Off.

THE SHAMROCK . . . . . **GLENN McCARTHY,** Owner
Architect-Engineer: **WYATT C. HEDRICK**
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STONE & WEBSTER ENGINEERING CORP.
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Foundation: **R. P. FARNSWORTH & Co., INC.**
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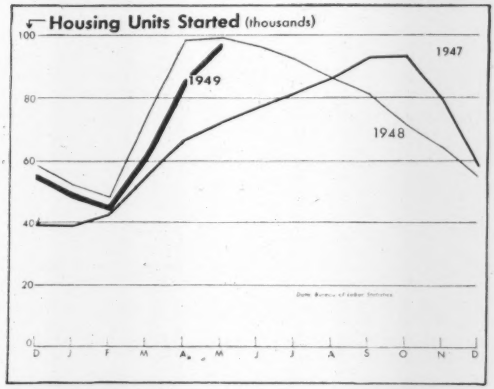
CONSTRUCTION TRENDS



Home-Building Booms

Home-builders are heading for a postwar record second only to 1948.

By starting 95,000 homes in May—according to Bureau of Labor Statistics figures—builders made it clear that in 1949 they may well top 1947's 849,000 starts. And they may not be far behind 1948's 931,300 new permanent, non-farm homes.

The chart above tells the story. Starts in 1949 lag behind 1948. But 1948 was an unusual year. Builders got going fast early in the season and reached their peak in starting homes in May. In 1947, on the other hand, builders started slowly, didn't reach their monthly high until September. So month-by-month comparisons of 1949 starts against either 1948 or '47 are somewhat misleading. But—however you look at it—the May figure, when builders almost matched last year's performance, promises another very good year of home-building.

In May, too, firming markets in many areas made builders more optimistic than they were earlier in the year. A survey made by correspondents of ENGINEERING NEWS-RECORD and BUSINESS WEEK brought out a reassuring picture. The survey followed a similar spot check of builders made in February. Builders then were fairly optimistic about the outlook. The May check revealed that builders, going ahead with their February plans, are on the whole starting more units than they had planned. Some of the big speculative builders covered in the survey were revising plans downward, true. But on balance, where plans have been changed, the changes have been upward more often than downward.

The survey revealed good news for the 1949 home-buyers, too.

They are, in almost every case, getting more house for their money this year. The survey showed no uniform pattern of price cuts—although some builders had made cuts of as much as 10 percent. But builders generally report that better productivity among workers and particularly better quality materials are allowing them to give customers considerably better value for their money.

Builders, too, are shifting rapidly to lower-cost homes—as ENR's February survey showed they expected to.

What this can do to sales is shown in the case of Miller Homes, Inc., a custom builder in Detroit. Last year the firm turned out 612 houses at prices ranging from $9,500 to $30,000. This year Miller planned about 1,000 houses—at prices ranging from $6,290 to $8,200. But a burst of sales accounted for 1,000 homes in ten weeks—and brought the firm to revising its 1949 plans upward to 1,500 houses.

That general shift to lower-cost homes and the better quality of today's houses make it difficult to compare 1949 homes to 1948's. Prices of comparable houses may be down perhaps 5 percent from last year, but the houses are better values or builders throw in extras, such as dishwashers, to make them more attractive.

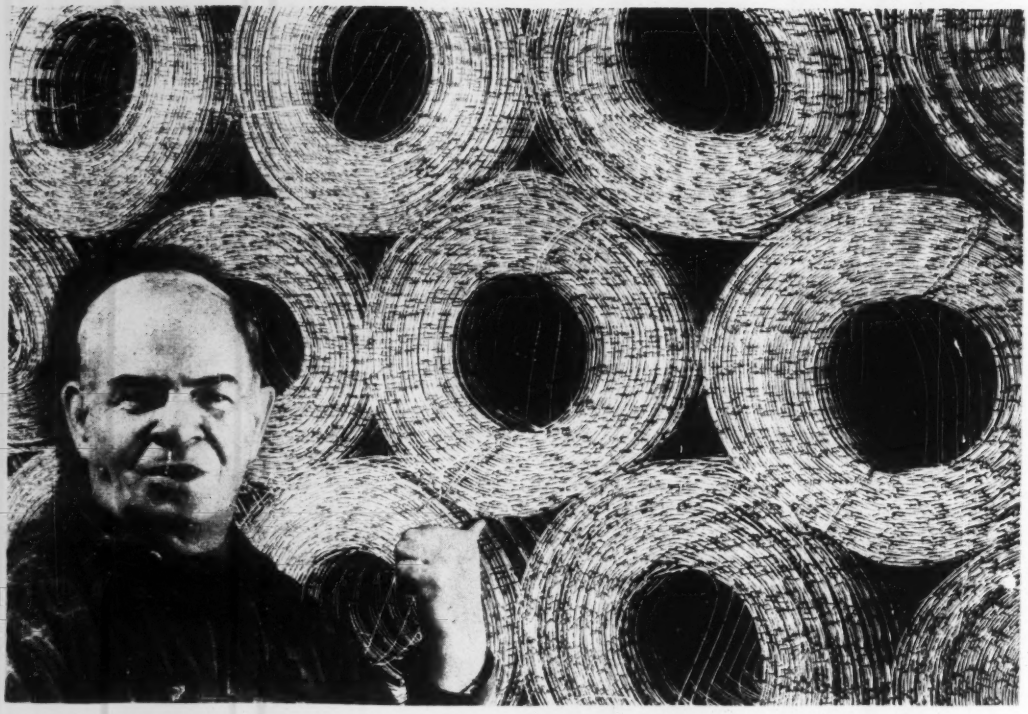
The survey revealed two pressing worries among builders. They fall in the selling end of the business—shortages of materials or labor no longer bother contractors.

The troubles:

(1) Prospective customers, reading reports of widespread cuts in material costs, are looking for cuts of perhaps 20 percent in new house prices—rather than the 5 percent or so builders are offering. But builders find that they can keep sales up by using every sales device in the bag and with the help of better quality built into 1949 homes.

(2) Wage increases are wiping out some of the savings in material prices. In many areas they threaten to push prices still higher. In Cleveland, and other cities, builders fear that wage increases may add as much as $500 to the price of a $10,000 home—and that the public would not accept the increase. On the other hand, some cities, among them St. Louis, report that many major building trades have decided to pass up wage increases at this time. Many builders, too, expect better productivity to make up for the extra wages.

Despite these troubles, home-building is booming and the boom seems strong enough to last through the year.



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THE CONSTRUCTION WEEK

CODE WRITING CONTINUES—The Building Officials Conference of America now estimates it will take another $35,000 to complete writing its basic building code, which will be sponsored as a model on a national scale. Money has been slow coming in from BOCA's chief source—material manufacturers. You can put down as the chief reason dissatisfaction of the Producer's Council (the sponsoring group) with the powers delegated by the BOCA to its subsidiary, the Building Officials Foundation. Producers Council doesn't contribute money of itself, but individual members do—and the official Council attitude discourages contributions to the BOF. Last week in Washington, BOCA and PC reportedly reconciled their differences, and under the PC blessing, code writing continues.

BOOKKEEPING TRICK—The federal deficit for the fiscal year that ends June 30 will be about $2 billion—but red ink won't show on the Treasury's books. The 80th Congress fixed that by a law in which it directed that $3 billion of last year's surplus be called this year's income.

SYNTHETIC FUEL SITES — Five engineering firms are now at work surveying 37 states and Alaska for suitable locations for plants to make synthetic liquid fuels from coal, oil and gas. The survey will attempt neither to select specific sites nor to determine total available reserves. Instead, it will give consideration to water supply, power, transportation, housing and markets—plus quantity and quality of raw materials. Ford, Bacon and Davis, New York, are overall contractors, under a $1,340,000 award by the Corps of Engineers. Assisting will be: Malcolm Pirnie Engineers, New York; Paul Weir Co., Chicago; De Golyer and McNaughton, Dallas; Max W. Ball, Washington, D. C.

POWER ROUND WON—The Holyoke (Mass.) Water Power Co. won the first round in its contest with the City of Holyoke Gas and Electric Department for the right to build a hydro plant at a dam the company owns on the Connecticut River. A Federal Power Commission examiner ordered issuance of a 50-year license to the power company, finding the company's development $8,000,000 cheaper than that proposed by the city.

PRODUCTION DROP — Most economists now seem to be looking for a drop in industrial production in the next six months—but all think what's coming is a short cycle that will hit a low next spring, then start upward again. They think the drop might go as far as 22 percent below the postwar peak of October, 1948, with durable goods taking most of the losses.

WHERE'S DANGER?—Considering the possibility of increasing unemployment, Administration stalwarts are beginning to talk about the "peril point"—meaning the level of unemployment where a stepped-up government spending program will be needed. The "peril point" guesses center between 4,500,000—5,000,000 unemployed. But in any case, the Joint Congressional Economic Committee is now talking about an economic meeting for late summer, where business, investment groups, labor, agriculture will be asked to give their opinions on what can be done to halt unemployment, and what can be done to promote private capital investment.

WORLD RESOURCES—Plans are beginning to take definite form for the United Nations Scientific Conference on the Conservation and Utilization of Resources—to be held at Lake Success August 17-Sept. 6. There are to be 400 scientific papers for consideration at 60 sessions. That's over six papers per session, and prospective delegates hope the seats are comfortable and the air-conditioning is in good working order. Civil engineers will take a large part in the sessions on water power.

PRODUCTIVITY UP, EXPERTS DOWN—Labor productivity is higher than government figures have said. The Bureau of Labor Statistics has for years estimated efficiency from samplings tied to the number of workers shown by the 1939 census of manufacturers—adding to the '39 total as sampling showed increases in the labor forces. But the figures for the 1947 census—just completed—show BLS has estimated employment about 1,000,000 workers too high, and BLS statisticians discovered they have divided total output by about 7 percent too many workers. Result: A per-man-hour output figure that is much too low. It will take a while to get an industry-by-industry breakdown of the error.

HOLDING COMPANY CO-OP?—The Rural Electrification Administration is considering backing the New Hampshire Electric Cooperative (of Plymouth) in a unique deal that would make the co-op a federally-financed holding company. The deal would automatically make the co-op a holding company, subject to the Securities and Exchange Commission, but officials are expected to ask exemption on the grounds that the co-op's business would be entirely within the state.

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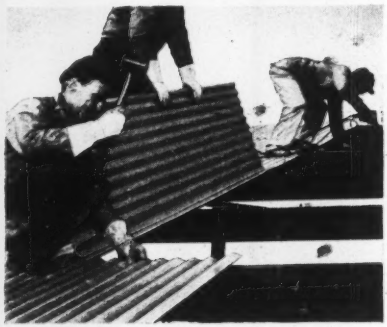
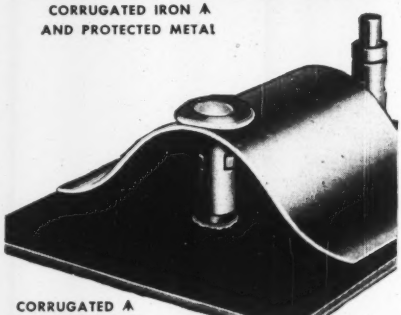
Better application and comparable time-savings are attained in applying corrugated iron and aluminum. In addition, no inside scaffolding or rigging is required, no workmen needed under the roof. Savings of more than $2.00 per square over other methods are common.

Nelson stud welding equipment is easy to operate, inexpensive to buy or rent. Nationwide field engineering service. Mail the coupon for complete information about this remarkable method.



CORRUGATED IRON ▲ AND PROTECTED METAL



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Everybody Loses

COURT SETTLEMENT of the controversy that has raged over the engineering work involved on Matilija Dam, a flood control structure in Ventura County, Calif., emphasizes anew the importance of dam foundations. The engineer had to give up nearly three-quarters of his fee because the court judged the foundation exploration to have been inadequately handled. The flood control district paid twice as much for the dam as it counted upon originally. So everybody lost on the operation.

The Matilija situation is not unique. Those who buy engineering structures are too often reluctant to spend money on preliminary surveys and designs. Engineers, all too often, try to do the impossible with the funds that are available. Foundations for dams present some of the most difficult problems of civil engineering. Since they become more difficult as the really good damsites diminish in number, there is all the more reason for adequate—and often costly—foundation exploration prior to design. Only with the data available that such exploration provides can proper decisions be made. These decisions may call for construction costs far beyond the client's hopes. They may require positive recommendations to abandon the site. Or they may involve a recommendation that a dam can be built for the funds available. The client is entitled to the proper one of the three conclusions, but unless the client will provide the money for predesign investigations, there is no assurance that the proper conclusion will be drawn. On the engineer's part, he must insist that adequate funds for foundation studies are available. When he fails in this duty, one of the best assurances of efficient engineering service is lost.

Earthquake Dividends

PROCRASTINATION in heeding the threat of earthquakes is a charge that can justifiably be leveled at the majority of the country's building officials and structural engineers. Some find excuses in the belief that the problem is of concern only on the Pacific Coast, forgetting the 'quake records of Montana, Massachusetts, South Carolina and other states. Others, on the Pacific Coast, utilize the same false premise applied to smaller geographical areas.

Two results of the Northwest earthquake of last April are, therefore, noteworthy. As reported last week, the University of Washington's Engineering Experiment Station is undertaking complete documentation of damage in the 10,000-sq. mi. area of western Washington and Oregon as a basis for building code revisions. Now comes the superintendent of schools in San Francisco requesting California structural engineers to give him some rules for human conduct during earthquakes, which will assure maximum personal safety even though buildings are safe against major structural collapse.

Both these developments are useful in keeping interest in earthquake safety alive. The earthquake hazard is a national hazard, and good building design requires that it be so recognized. Since compliance with sensible precautions is not expensive, only a changed attitude stands in the way of improvement. The new interest generated by the Northwest quake will beget useful dividends if even one additional city or state tightens its building code provisions relative to earthquake safety.

Safer Shoring

TWO COLLAPSES of concrete formwork in recent weeks raise the suspicion of inadequate shoring. In both cases —a reservoir roof in Santa Monica, Calif., and a building floor in New York City—tall shores were involved. These are very slender columns in which the l/r ratio is all important. Therefore, horizontal struts to keep this ratio low and some sort of diagonal bracing arrangement to add extra stiffness are necessary elements of the framing. Unless, however, the connections of these elements are completely secure, a potential origin of progressive failure is always present. How carefully do you detail these connections? How confident are you of the strength of your shores as columns? How certain are you that the shores are erected as designed? These questions need more careful consideration in the light of these recently reported failures. Both lives and money are at stake.

Federal Reorganization

CONGRESS FINALLY QUIT STALLING and gave President Truman the power to reorganize the executive department of the government, as the Hoover Commission recommended. This is good news. And the plan providing for a 60-day veto of any plan submitted by the President is a step in the right direction. It provides the necessary democratic safeguard of full debate on any submitted proposal, and it omits the earlier requirement that the President should leave out of any general plan several specified agencies including the military establishment and its Corps of Engineers. The Hoover Commission's public works recommendations were quite specific on the civil functions of the corps. We do not think the recommendations were in all respects wise, but the President should not be denied the opportunity to consider them. On him and Congress rests the responsibility for governmental efficiency. The new bill opens the door of opportunity.

A Reflection of Highway Safety with—

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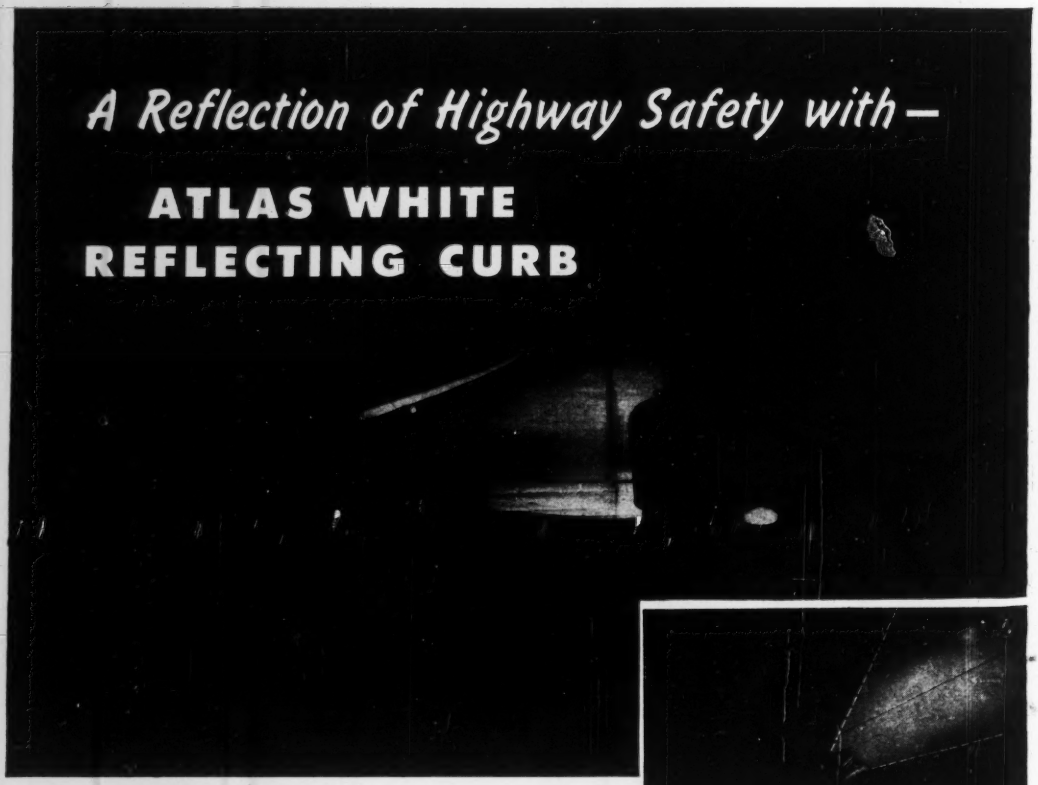

The driver of this car is fortunate. Driving along this highway is easier on his eyes and nerves. Chances of accident are reduced. Why? Because he can easily see the white guide that edges the highway . . . Atlas White Reflecting Curb made with Atlas White Cement. It gives him a clear outline of the road ahead.

Scientifically designed saw-tooth faces of white reflecting curb act like so many small mirrors when hit with beams from a car's headlights. They reflect the light back to the driver. This concentrated illumination greatly aids the driver's vision on a dry night . . . and on wet, rainy nights the reflecting curb becomes even more mirror-like and shows up even brighter.

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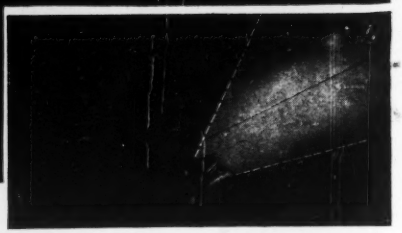
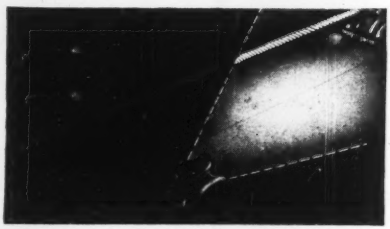
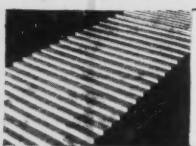


A smooth curb wastes the car's headlights. It reflects light away from the driver. Edge of road is difficult to see. Driving dangers are increased.



White Concrete Reflecting Curb utilizes the car's headlights. Saw-tooth faces mirror the light back to driver; form a continuous, bright ribbon of light at the road's edge. Driving is safer.

ENR-RM-57



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ENGINEERING NEWS-RECORD

JUNE 23, 1949 VOL. 142 NO. 25

House rules reversal releases public housing bill for debate

Democratic version of housing-slum clearance measure goes to House floor for expected final approval—Senate has passed a similar bill calling for 810,000 units

The House this week gets its chance to vote on what the last Congress called the TEW bill (Taft-Ellender-Wagner). An about-face by the Rules Committee last week released the current Democratic version of the public housing-slum clearance measure to floor debate. The Senate already has passed a similar bill (ENR March 10, p. 13).

Under the open rules adopted for the House version by the committee, the lower chamber will have one hour to debate the rule itself and eight hours to argue the bill. The vote on the rule will pretty well establish the chances for the bill. Some amendments are likely to be accepted, but all indications at the end of last week pointed to final House approval of the bill.

The open rule admits an unlimited number of amendments. Every member of the House who wishes to speak is entitled to talk for five minutes on each amendment. Actually, only a few of the 435 members will want to debate most of the suggested changes. The bill is likely to come up for final vote within a week.

Same group blocked TEW

Bottling up of the housing bill in the Rules Committee this year caused some surprise to the country as a whole. In the Republican-controlled Congress last year, the same committee blocked House consideration of TEW—after the House Banking Committee had overridden its own chairman, Rep. Jesse Woolcott of Michigan, by reporting the measure.

Just two weeks ago, the Rules Committee of the present House repeated the action of its predecessor group by refusing to clear the Administration's long-range housing bill for floor debate. Three southern Democrats lined up with four Republicans to stop the measure by a 7 to 5 committee vote. Over the following weekend, two of the southerners and one Republican—Representatives Colmer (Miss.), Cox (Ga.) and Herter (Mass.)—changed their minds. Their switch produced last week's reversal.

Largely explaining their action, the bill would have come up in the House on June 27 anyway. The House this year adopted a new rule to permit bypassing of its Rules Committee. Chairman Spence of the Banking Committee, which previously had approved the House bill—bearing his name by the way—already had introduced the necessary bypassing resolution to discharge the bill June 27.

Declining federal income is not expected to hold up the bill to authorize public housing and slum clearance. After the Senate had approved federal rent subsidies running 40 years for 810,000 dwelling units to be built in six years, the House Banking Committee went a step higher—in accord with the Administration's original proposal. The House committee reported its bill for 1,050,000 units in seven years, to be subsidized by the same kind of 40-year contracts with local housing authorities. Maximum annual subsidy cost—under the House bill—would be $400 million. The Senate measure limited it to $308 million.

Both bills would authorize a five-year slum-clearance program financed by $1 billion in loans and $500 million in grants. They also agree on an expanded research program by the Housing and Home Finance Agency. Their figures for three-part aid to farm and rural housing are not far apart: the higher Senate total on this phase calls for $275 million.

Opponents of the measure in the House probably will use some figures from a public opinion sample poll released last Friday. Claude E. Robinson's Opinion Research Corp. of Princeton, N. J., made the survey for the U. S. Savings & Loan League of Chicago.

On specific details, the majority of the 2,200 persons interviewed opposed spending tax monies on government housing.

President signs reorganization bill

Senate-House agreement last week on a bill to authorize reorganization of the executive branch gives the President an opportunity to submit plans of the kind recommended by the Hoover Commission. President Truman signed the bill on Monday and immediately sent initial proposals to Congress.

One of the first plans included reshuffling some of the engineering-construction activities of the federal government—calling for a shift of road work from PRA to the Commerce Department. Complexity of other construction proposals (such as those affecting the Corps of Engineers) and diehard opposition to some of them in the present Congress probably would delay their presentation, Washington observers felt. According to the law, either house of Congress can veto a presidential plan by the vote of a constitutional majority—more than half of the total membership—within 60 days after the plan is submitted.

As the present session of Congress is likely to adjourn in August, the 60-day requirement makes speed essential in sending proposals to the Hill. For a plan to take effect, it must lie before Congress during 60 calendar days of a continuous session.

Even before Congress passed the reorganization bill, it took under active consideration different plans for the Federal Works Agency from those suggested by the Hoover Commission. The House two weeks ago passed a bill to create a new office of general services to which all the functions of FWA would be transferred.

Prime purpose of the new office would be to centralize the buying of all supplies for the government. The bill—if passed—would lump several agencies employing 60,000 persons into one unit. It would buy everything from paper clips to building sites.

NEWS BRIEFS

Large Scale Housing—Ground has been broken at Seattle, Wash., for a $3,500,000 structure the builders claim as one of the largest apartment buildings under a single roof in America. It will be an 18-story building with 1,100 rooms in 370 apartments, as well as a 250-car garage and 17 stores, according to Paul Keller-Block, head of the apartment corporation.

Illinois Roads—The Illinois Department of Highways has listed $51,000,000 of urgently needed primary road construction jobs outside of Chicago and Cook County to be begun in 1949. The program also includes an expenditure of $39,000,000 on secondary roads, $3,000,000 for concrete patching and $9,000,000 for additional rights-of-way in Chicago and Cook County.

Bomb Resistant Hospital—Officials of the Seaside Memorial Hospital in Long Beach, Calif., want the city to build the world's first A-bomb resistant hospital at an estimated cost of $8,000,000. In the event of attack, 700 patients and the hospital staff could be shifted from the steel surface structure to the three-level subterranean section, where they would be protected by 22 ft. of earth plus an 8-ft. ceiling of concrete and steel.

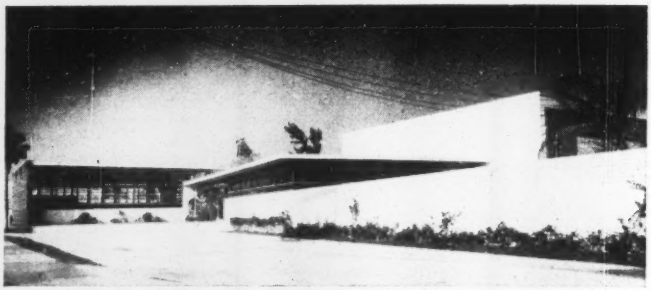
More Niagara Power—While the Hydro-Electric Power Commission of Ontario would prefer to see approval of the St. Lawrence waterway hydro development project, failing this they will concentrate on a huge expansion of generating facilities at Niagara Falls. The development would be a dual undertaking with the Niagara Falls Power Co. on the U. S. side of the river. The latter company has announced that it is prepared to spend $60,000,000 on a new plant. The Ontario commission has plans for an $80,000,000 project at Queenston.

Big Road Programs—Governor Paul Dever has signed the Massachusetts highway bill, providing for a $100,000,000 bond issue, and giving an emergency authority to Public Works Commissioner William F. Callahan to proceed with the construction program at once. By July 1 it is expected that $14,262,000 in highway and bridge construction will be placed under contract. On May 19 Kentucky awarded $2,003,531 in contracts for improving about 218 miles of roads. The Tennessee state legislature, before its recent adjournment, endorsed the program of Governor Browning, and his slogan "An all-weather road to every farm in Tennessee" when it passed an appropriation of $22,000,000, from a cash surplus, to be used for highways in the next two years.

Nebraska Road Improvements—The 3-point program to launch highway improvements in Nebraska as requested by Governor Val Peterson on recommendation of the Highway Advisory Committee has been enacted into law. It provides for a 1-cent increase in the gasoline tax, increased motor vehicle registration fees, and an equalization fee for diesel-powered vehicles. It is estimated that this measure will increase the state's revenue for road building by $5,000,000 a year.

New Court Buildings in L. A.—The Los Angeles County Board of Supervisors has approved preliminary plans for construction of a 12-story Superior Court Building, and appropriated $10,806,699 to cover building costs. At the same time the Board approved preliminary plans for immediate construction of a four-story municipal court house, allowing for addition of two extra stories when the need arises.

Final Hyperion Contracts—Peter Kiewit Sons' Co. and the Fred J. Early Co., Los Angeles, have been awarded the contract for the construction of the final two major units of the $41,000,000 Hyperion sewage treatment plant at Los Angeles. Their joint bid of $6,170,337 was lowest of three submitted to the Board of Public Works for a contract to build and equip the plant's aeration and settling systems.



WAREHOUSE-OFFICE FOR DRUG FIRM—McKesson & Robbins, Inc. has had this drug-storage and office building erected in Miami, Fla. The half-million-dollar structure has a steel frame and concrete floors, covers 71,000 sq. ft. and is air conditioned in part. Gust K. Newberg Construction Co. built it from plans by Robert Law Weed and Associates, architects.

L. A. firm awarded fee in Matilija Dam law suit

The engineering firm of Donald R. Warren Co., Los Angeles, was awarded a net of $33,437 in a counter suit brought by the company against the Ventura County Flood Control District after the district had brought suit to collect $1,236,000 from the Warren company (ENR May 2, 1948, vol. p. 753). The district had charged that the company was negligent in the design and construction of Matilija Dam in that it (1) failed to conduct foundation explorations at the dam-site, (2) caused concrete to be poured on inadequate and incompetent foundation material and (3) redesigned the dam as the project proceeded. The dam cost about $2,200,000 as against Warren's original estimate of $700,000.

The Warren company in its counterclaim sued for fees on Matilija Dam (ENR June 10, 1948, vol. p. 958) and Casitas Dam (the latter not yet built).

The decision was rendered by Judge L. N. Turrentine of San Diego after a month's consideration of the 70-day Superior Court case. The Matilija Dam was declared to be safe, and the site was stated to be not dubious nor marginal "for construction of a concrete arch type dam but safe and adequate with the usual and normal upkeep that can be expected in the case of all dams erected on like geologic structure."

Warren was awarded fees totaling $112,158 and court costs. The district was awarded $78,720 for negligence in the handling of exploration and excavation at "M," "N" and "O" blocks of Matilija Dam. Here concrete was placed on inadequate material that later had to be mined out and replaced.

Western highway engineers see need for better "public relations" plans

Western Association of State Highway Officials told of states' secondary-road worries—Name new officers

Emphasis in state highway departments must be shifted from the purely technical to the human aspect, western highways officials were told last week. Too much of the life of the highway bureaus—from granting of funds to public acceptance of needed improvements—depends on public approval for the departments to ignore public relations, speakers said.

The advice was echoed by numerous speakers at the four-day annual meeting of the Western Association of State Highway Officials, held at Denver, Colo., June 13-16. Top engineers of twelve western states attended the session, to hear technical and general sessions, and to watch seating of new officers, including W. T. Holcomb, Nevada highway engineer, president.

W. C. Lefebvre, Arizona state highway engineer and retiring president of the organization, keynoted the need for better public relations.

"I feel it is more important for the highway engineers to busy themselves more with human engineering, and less with technical matters," he said. "We will stand or fall by our contacts with the public. . . . The primary mission of the highway departments is to please the user."

Enlarging on the need for public contact, A. W. Nash, design engineer for the California State Highway Department, recounted some of the difficulties with freeway construction which he said arise from lack of public understanding of the purposes and advantages of this type of road.

Secondary roads

Increasing concern of the states over their secondary road programs, and over maintenance problems, was reflected in a number of the talks.

L. I. Hewes, director, Western Regional Office, U. S. Public Roads Administration, pointed out that the main problem in most highway programs is obtaining funds for the work. "Since there has been a shortage of funds for secondary roads," he said, "most of the money so far has been spent in widening, channelling traffic, or surfacing of gravel roads."

"Another thing that affects the finances is that the increase in maintenance work on completed highways is parallel to the demand for new roads," he added.

Roy W. McLeese, Utah state highway engineer, pointed out that the secondary-road problem in the west is far different than that of more populous areas. Many western states have the problem of financing passable roads to thinly-populated areas, where the local landowners simply cannot support the cost of the road.

Carl W. Brown, chief engineer of the Missouri State Highway Department, and President of the American Association of State Highway Officials, told his listeners that out of a 3,000,000-mile U. S. highway system, 750,000 miles are primary roads.

Mr. Brown and several other speakers stressed the necessity of guarding highway revenues by seeing to it that motor-fuel and vehicle taxes are not diverted to other state purposes.

Other speakers included Clarence Stahl, Montana state highway engineer; A. N. Carter, chairman of the AGC-AASHO joint committee; and numerous panel discussions in which all participated.

New officers

New officers elected by the group, in addition to Mr. Holcomb, are:

Vice-president, D. C. Greer, Texas; Secretary-treasurer, A. M. Nash, California; Executive committee—W. J. Denine, of Wyoming, Mark U. Watrous, of Colorado and A. N. Dinsmore, of Washington.

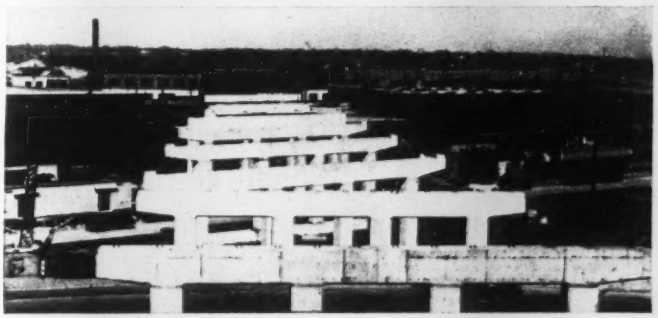
A date and city for next year's convention will be selected by the executive committee after an organization meeting.

INCLINED HOIST, 280-ft. long, goes up to bring down the earthquake-damaged cupola atop the Washington state legislative building at Olympia. A "skip," riding the inclined hoist, will lower about 100 tons of stone from the condemned cupola.

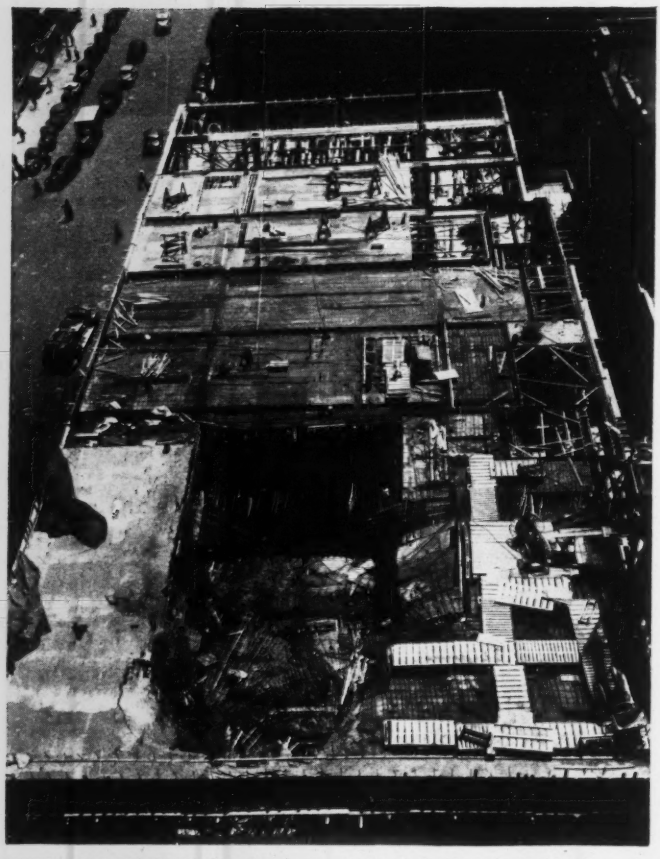
Court blocks condemnation for limited access roads

Plans of the Washington State Highway Department to make the Pacific Highway a limited access thoroughfare have had to be altered as the result of a recent State Supreme Court decision.

The court held the state could not use the power of condemnation to limit access to existing highways, although it could do so in cases of new highway locations. Therefore, the Pacific Highway may not be a limited access thoroughfare between Vancouver and Castle Rock, a distance of some 30 miles, but may be so from Castle northward.



IMPASSE? NOT HERE—Michigan wanted to extend a highway bridge on route 31 at St. Joseph; the Nineteen Hundred Corp. wanted to build a washing machine factory at the same site. Both did. Bridge piers rest inside the factory and the plant's roof is to be supported by the four-lane bridge.



WHEN THE SHORING FAILED as concrete was being poured, the fifth floor of a new reinforced concrete building in New York dropped two stories. (Wide World Photo)

DEBRIS HIDES EVIDENCE of cause of collapse. (ENR Staff Photo)

Forms fail, floor falls; 15 workers are injured

Concrete floor slab being poured falls two stories in New York City building as form shoring gives way

A 39 x 76-ft. floor section of a reinforced concrete building under construction in New York City collapsed on June 15, injuring 15 workmen, two seriously. The accident apparently was due to failure of the formwork shoring.

It occurred on the fifth floor of a 204 x 78-ft., 5-story and penthouse building being erected for Parke-Bernet Galleries.

Column spacing is 19 ft. 6 in. by 22 ft. 6 in., except under the area that collapsed, where columns are omitted in the sales auditorium. Occupying the center two bays on the third floor, at one end of the structure, this auditorium is two stories—22 ft.—high with no obstructing columns.

The slab above was 7-in. thick, 3,000-psi. controlled, ready-mix concrete. It was cast on ⅝-in. plywood forms carried on 2 x 4-in. wood stringers, spaced 12 in. on centers and extending to within 1 in. of the girders bordering the open well.

Two sets of 1-story shores used

Shoring consisted of patented 8-ft. high adjustable shores supported on 4 x 4-in., 14-ft. long studs, which rested on the third floor. They were spaced about 4 ft. apart. At the 14-ft. level, the shoring was braced in one direction with horizontal 4 x 4's and in the other direction with plank. Horizontal bracing in two directions was used above and below this.

On the morning of June 15 concrete had been cast in three bays on the fifth floor, adjacent to the auditorium, in plywood forms supported on the adjustable shores. After lunch, the auditorium slab was being poured when it suddenly gave way. The load dropped to the unshored third floor, which successfully withstood the impact. However, as a precautionary measure, temporary shores were immediately inserted under this floor.

The nature of the debris prevents determination of the point of origin of the collapse.

The contract for the concrete frame is held by R. E. Carrick Co. of New York City.

Parke-Bernet Galleries is being erected at an estimated cost of $1,000,000 by City Construction Co., a subsidiary of City Investing Co., the owner. Walker & Poor are architects and Fred N. Severud is the structural engineer.

S. F. structural engineers set 'quake safety rules

Rules for safety during earthquakes have been offered to the San Francisco superintendent of schools by the Structural Engineers Association of Northern California. These rules were compiled as a result of a request by the superintendent following the recent Pacific Northwest earthquake in which one school pupil was killed and several were injured.

After pointing out that major structural damage such as the collapse of roofs or walls is unlikely in California school buildings designed or strengthened under the requirements of the Field Act, a letter to the superintendent lists the following recommendations for maximum safety during earthquakes:

1. Occupants of buildings should stay inside. Due to the danger of falling material from the face of the building, the rooms are generally safer than the outside areas adjoining the buildings.

2. Protection from fragments of plaster falling from the ceiling is advisable. School children should be instructed to crouch under their desks, and occasional drills in this procedure would prevent the panic and confusion which, in time of emergency, add greatly to the danger.

West Coast brick makers publish test results

A series of technical bulletins dealing with brick have been announced recently by the Clay Brick Manufacturing Association of Northern California. The first of these deals with tests on unreinforced brick masonry and copies are available from association headquarters at 55 New Montgomery St., San Francisco.

Later bulletins will follow on brick walls partially reinforced and on reinforced masonry. Others are contemplated.

The bulletins are prepared by the association staff under the direction of George E. Solnar, Jr., manager. As consultant in the work, the association has retained Prof. J. B. Wells of Stanford University.

Best home environment to be studied by NAHB

Special studies to make sure that American families get the best in land planning and site arrangement for their new homes have been put under way by the National Association of Home Builders, it has been announced. The work will be under the direction of the NAHB land planning committee, made up of some of the nation's foremost authorities on neighborhood development.

Providing the best possible physical environment for homes is the goal of the association's committee. David D. Bohannon, California, developer and builder, recently was made chairman of the group, which has launched the studies of how better land use can be attained.

Thirty prominent home builders from all parts of the country serve on the land planning group with Mr. Bohannon. Through consultation, meetings and studies, the committee hopes to place before builders the latest techniques of land use and development. As a result, the group anticipates that a well planned neighborhood with convenient facilities will be available to any family seeking a new home, regardless of possible price range.

PERSPECTIVE . . .

New Look for Venezuela

Last November's political coup in oil-rich Venezuela didn't appear to change things too much on the surface. But there is a significant difference. It's true enough that the coup was engineered by the Venezuelan army just as was the one that seated the government of former President Romula Gallegos. But the new group is changing the business and political pattern of the country.

Where the old "Accion Democratica" government had a strong leftist and pro-labor tendency, the present government—still army-controlled—is following a moderate policy toward labor, seeking to win over the sympathies of the rank and file and eliminate political agitators from the labor movement.

Encouragement to business—both foreign and domestic—is an avowed government policy, and the government is making a strong bid for more American capital and technology to develop and diversify the nation's economy.

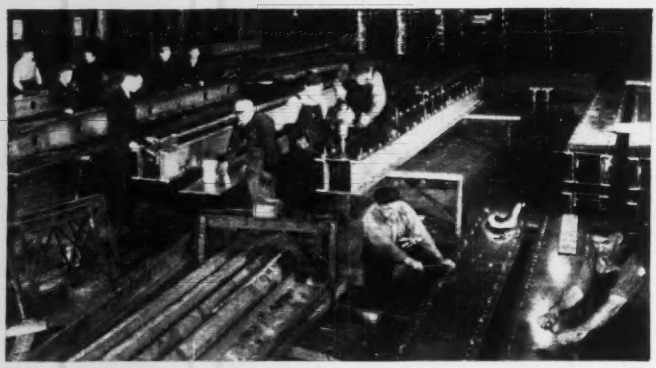
Three young army colonels rule the country by decree, but the cabinet is largely civilian, including leading specialists brought in to reorganize the administrative machinery and to shape new policies. One of these is Dr. Pedro Ignacio Aguerrevere, Minister of Development, who is planning a visit this summer as a good will ambassador to impress business leaders here with the opportunities and the political and economic climate existing now in Venezuela for sound new enterprises. Dr. Aguerrevere, an engineering graduate of Leland Stanford University and an authority on Venezuela's natural resources, is enthusiastic in talking of opportunities for business that would supplement the U. S. stake of more than one billion dollars in oil. He points up especially the heavy wastage of natural gas.

Another point long neglected is the country's store of iron ore which now ranks highest as a potential for development. With completion of a 30 mile standard gage railway and river and port facilities, the Bethlehem Steel Corporation plans to start shipping high grade ore from its concessions along the Orinoco river by the end of this year. U. S. Steel has a similarly large concession in the same region which it is exploring preparatory to development.

Turning every possible means to develop other sources of revenue than the oil business, the government is developing plans to encourage new agricultural projects. Recognizing the importance of transportation, it is pushing a great roadbuilding and port improvement program, and has engaged the U. S. engineering firm of Ford, Bacon & Davis to survey the country's railway requirements. Other public works projects such as schools, hospitals and railroads will contine to involve heavy expenditures.

Plans for the coming year include hard surfacing 500 miles of existing roads; construction of 400 miles of new roads; substantial work in improving port facilities, and continued construction of new schools and hospitals. The total public works program for the next fiscal year to cost $100 million.

Major highway project is the long planned road between Caracas and the main sea and airport at La Guira. A four-lane concrete super-highway to replace the present narrow mountain road and reduce the distance from 20 miles to about 10 is now in a preliminary bidding stage, with construction planned to start in September.



ALUMINUM FOR ARVIDA BRIDGE—The aluminum arch highway crossing at Arvida, Que., is under way, and fabrication nears completion at the Lachine plant of Dominion Bridge Company, Ltd. Erection of the unique superstructure (ENR June 3, 1948, vol. p. 917) will start this year. The main arch will be two web plates, four angles and two cover plates, forming a closed box 54 x 32 in.

Science Foundation seen set up by fall

Congress is now ready to set up a National Science Foundation to promote research in universities and laboratories.

The Priest bill approved last week by the House Interstate Commerce Committee meets the objections President Truman had against legislation he vetoed two years ago. And Rep. Priest of Tennessee is pretty sure he can get the green light to put the law through the House before summer adjournment. The Senate already has voted a similar bill (ENR April 7, p. 16). The plan is to get the program started this fall.

The proposal puts the federal government into the business of developing such sciences as mathematical, engineering, physical, medical and biological. Cost will be roughly $15,000,000 in the first year, stepping up to $25,000,000 a year when the program is in full sway.

In brief, the Science Foundation will:

(1) Maintain a register of scientific and technical personnel, and provide a clearing house for information covering scientific and technical personnel.

(2) Award scholarships and graduate fellowships to students for basic research—the awards will total roughly $2,500,000 a year.

(3) Contract with universities and laboratories for scientific research in the various fields such as engineering and physics—the contract authority is budgeted at $12,500,000 the first year.

The Foundation would consist of four divisions to direct research in medicine, engineering, mathematical and physical sciences, biological sciences and scientific personnel and education.

The major difficulties the program has had in the four years it has been before Congress were over the administrative set-up, and the question of patent rights.

Truman vetoed the only measure Congress sent him because the proposed governing board of the foundation would have been practically autonomous. The Priest bill provides that major executive functions will be in the hands of a $15,000-a-year director responsible to the President.

Chicago engineers' strike ends after four days

Engineers, inspectors and draftsmen working for the city of Chicago went on strike last week to enforce demands for higher pay and job reclassification. The strike lasted four days and was settled Monday when the city civil service commissioner named a three-man committee to work out a new job classification system. The question of money is subject to further negotiation pending adoption of the city budget July 1.

Employees—members of Local 90-A, Technical Engineers, Architects & Draftsmen's Associations (AFL)—walked out when the city turned down the union's demand for salary increases of $50 to $150 per month. Work on some $20,000,000 of municipal projects was affected.

Estimates of the number of men on strike varied. The union set the figure at 500; the city at half that.

Despite the strike, work continued on city projects now under construction. Some jobs were picketed by striking union members but the construction trades tended to ignore the pickets and continued to work.

The union contended that the pay increases sought would only bring members' salaries up to the level of those paid by private firms and industry.

6-man group to decide fate of White House

It's going to be up to the six-man White House Commission to decide what to do with the executive mansion. Congress last week gave up the futile two-month effort to get House-Senate agreement on a rebuilding policy; the conferees compromised on passing the decision to the six-man board previously set up (ENR May 5, p. 13).

Disagreement over renovation as desired by the Senate versus replacement as advocated by the House had reached a stalemate. Last month the prolonged debate between conferees from the two houses had caused the White House appropriation to be shifted backward from the first deficiency to the second deficiency bill for fiscal 1949. To get the second deficiency measure through Congress, the two branches last week agreed to let the commission settle the issue.

Two past presidents—of the American Society of Civil Engineers and the American Institute of Architects—carry the responsibility for technical advice on the commission. Both of these men—Richard E. Dougherty, retired New York Central vice-president, and Douglas W. Orr, New Haven, Conn., architect—served previously as consultants in preparing the report on elimination of structural and fire hazards in the executive mansion (ENR Feb. 24, p. 11).

Newark firm heads study of N. J. road's north end

Edwards and Kelcey, consulting engineers of Newark, N. J., and New York City, will manage and coordinate studies on the northern section—New Brunswick to the George Washington Bridge—of New Jersey's planned $150 million toll road (ENR June 9, p. 54).

Dean G. Edwards, partner in the firm is project manager of traffic and route studies already started, in which the following consultants all have a part: O. J. Porter & Co., Newark; Ammann and Whitney, New York; and Frederick R. Harris, Inc., Elizabeth, N. J.

NLRB: Chiefs of party not considered union men

"Chiefs of party," who direct surveyors, are supervisors exempt from the protection of the Taft-Hartley Law." At the same time, it was ruled that cost estimators' work is not of a confidential nature relating to labor relations, but employees doing this work have professional status.

These rulings were made by the National Labor Relations Board in a case involving employees of the Guy F. Atkinson and J. A. Jones construction companies at the Hanford atomic energy project at Richland, Wash.

The companies had no objection to the request of the Technical Engineers and Architects Association, Local 17, to represent all engineering employees and inspectors. But they did oppose the inclusion of estimators and "chiefs of party."

By agreeing with the companies that "chiefs of party" are supervisors, the NLRB has excluded them from the bargaining unit. It found that these men "responsibly direct" surveyors working under them and "may effectively recommend the hiring and discharge of employees."

The board ordered two elections: One will be among all engineering employees and inspectors. The other will be a separate election for the cost estimators. As professional employees, they will vote on whether they wish to be included with the others, or not have any union representation at all. The local is affiliated with the International Federation of Technical Engineers, AFL.

Yale research on timber may help lessen shortage

An answer to the world's growing shortage of high-grade hardwood may be provided by a two-year research program at Yale University, where the school of forestry under the sponsorship of the Office of Naval Research has found that many species of tropical hardwood exhibit economic potentialities superior to a number of timbers now in common use.

The results of this research were announced recently by Frederick F. Wangaard, associate professor of forest products at Yale, at a symposium on woods in the National Academy of Sciences at Washington.

Mr. Wangaard explained that Yale's School of Forestry has been engaged in tropical woods research for more than 25 years. Studies were made to determine the basic characteristics of a selected group of tropical American timbers, and to evaluate each species with regard to its potentialities for specific uses.

Mr. Wangaard went on to say that this new information is calculated to lead to the supplementing of native U. S. species, thereby taking the pressure off this country's forests and presenting the opportunity for replenishing the woodlands. The study group conducted tests upon the mechanical properties, or strength of 25 woods; the density of weight; the dimensional stability, decay resistance, and seasoning characteristics.

In tabulating the results, Mr. Wangaard presented statistics illustrating the tropical woods which have been found suitable for popular uses. They are, in part, as follows: 11 species with the qualities of freedom from warp, low shrinkage, hardness, abrasion resistance, good weathering characteristics, low moisture absorption, durability and moderate weight, such as required in marine decking; hardness and abrasion resistance and good appearance, characteristics needed for residential, store and office flooring are found in 17; and 20 varieties are suitable for furniture and cabinet work.

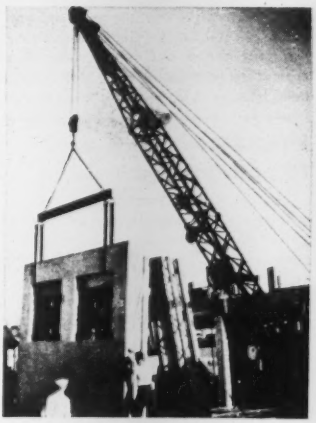
Sandwich walls save time and money

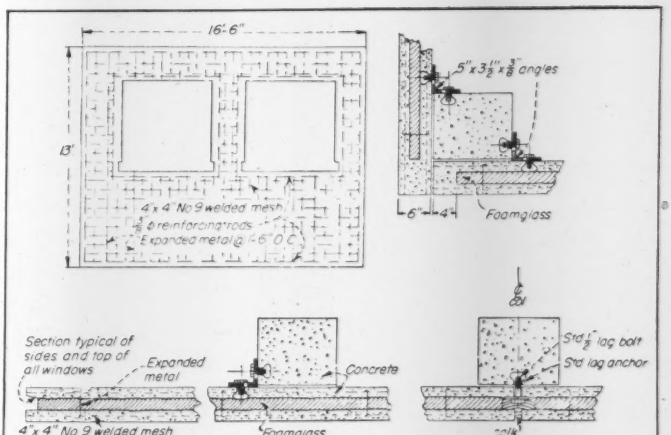
Concrete curtain walls, precast and insulated, have been put to effective use recently in industrial buildings both in the U. S. and in Canada.

Most popular is 6 in. thick—2-in. cellular glass insulation sandwiched between two 2-in. concrete slabs. The panels are precast in a horizontal position. Excess water is removed from the concrete mix by the vacuum process, and the slabs are machine troweled. The surfaces require no additional finishing, other than painting.

This wall weighs from 40 to 60 psf., depending upon aggregate used—one-third the weight of a typical masonry wall.

Substantial time saving in construction is claimed by users of the method. Dollar savings over comparable construction costs have been reported, the cost running well under $2 per sq. ft. (Pittsburgh Corning Corp. Photo)





TYPICAL SECTION OF CONCRETE-CELLULAR GLASS PANELS

INSULATED AND REINFORCED, sandwich walls weigh less than masonry walls.

ONE FLOOR PER DAY is the rate at which Corbetta Construction Co., Inc., of New York is pouring concrete slabs at the N. Y. C. Housing Authority's Eastchester Houses in the Bronx. Cranes are placing 320 cu. yd. of high-early strength concrete per day from the ground into plywood forms on the 14,000-sq. ft. floors. There will be 874 apartments in 10 buildings, seven and eight stories high, when the project is completed next January. (McLaughlin Air Service Photo)

Urge 8-point program to push private building

An eight-point program for encouraging building activity was recently put forth by Douglas Whitlock, chairman of the Building Products Institute, in a talk before the New York chapter of the Producers' Council and the American Institute of Architects.

Mr. Whitlock said private construction may drop 10 percent in a buyer's market this year and urged that his listeners back a program to:

(1) Sell the public on today's increased values and remove the impression that costs are unduly high.

(2) Urge amendment of FHA regulations that discourage building.

(3) Discourage national inflationary policies that drive up costs.

(4) Work toward an increase in the productivity of labor.

(5) Bring about revision of local building codes which hold up construction costs and prevent the introduction of new materials and stimulate enforcement of local building regulations which will remove obsolete homes from the market and thus step up the demand for new homes.

(6) Urge reduction of federal expenditures for public housing and encourage the public to wait for government-subsidized homes.

(7) Revise tax laws so as to encourage greater investment in construction activity.

(8) Answer the critics of the construction industry who undermine public confidence in the industry and in the values it offers.

Building code commission proposed for Illinois

A bill to create a state building code commission in Illinois has been introduced in the legislature of that state by Representative Paul J. Randolph of Chicago.

Besides formulating rules and regulations for construction, the object of the commission would also be eventually to eliminate restrictive obsolete, conflicting, and unnecessary building regulations and requirements.

Another objective of the bill, modelled after one recently passed in New York State, would be to bring about better codification and the establishment of standards for equipment and material to promote safety, sanitation and fire prevention.

The proposed commission would consist of five members appointed by the governor, subject to confirmation by the State Senate, with salaries of $7,500 annually for the chairman and $7,000 each for the other members.

AEC gets $2.5 million bid on Oak Ridge high school

The Atomic Energy Commission last week opened bids on two major projects to be constructed in the Oak Ridge, Tenn., area. A new high school designed to accommodate 1,500 students, and the development of an 108-acre tract for a shopping center for the Oak Ridge community (ENR June 9, p. 50) will get under way as soon as AEC approves the contracts.

John A. Johnson & Sons, Inc., of New York, bid $2,490,806 to construct the new school. The project consists of four individual buildings of concrete block with brick facing and containing a total of 185,559 square feet.

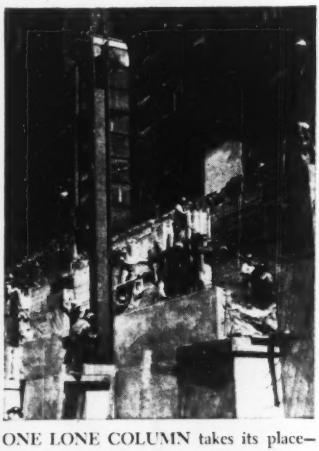
A low bid of $1,124,179 was submitted by the Ralph E. Mills Company, Inc., of Frankfort, Ky., for site development of the proposed Oak Ridge shopping center. Work includes construction of 3 miles of asphaltic concrete road, about 5,140 sq. yd. of parking area, approximately 108 acres of rough grading, 500,000 cu. yd. of excavation, sanitary and storm sewers, water distribution system, 15,000 sq. ft. of concrete sidewalks, electrical distribution and fire alarm systems, and a natural gas distribution system.

British Columbia to spend millions for new schools

During the current year the British Columbia government expects to spend $5,800,000 in a school-building program.

New schools are now under construction in all parts of the province.

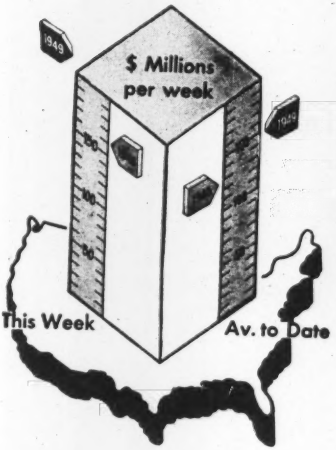
Total school enrollment has increased from 130,000 pupils in 1945 to 158,000 in 1949. This has necessitated finding accommodation for 900 new classes. At the present rate of increase in enrollment, the Minister of Education estimates that 250 new classrooms will have to be built and opened each year.



ONE LONE COLUMN takes its place—to be followed by many more—as steel erection starts on the 25-story Mutual Life Insurance Company office building at Broadway and 55th St. in New York City. Turner Construction Co. plans to complete the structure by mid-1950.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	June '49	473.78	227.75
Building Cost	June '49	349.28	188.81
Volume	May '49	275	121



Activity This Week

As reported to ENR
(in millions of dollars)

Amount of Contracts let

Week of June 23 1949	Cumulative 1949 (25 wks.)	Cumulative 1948 (26 wks.)	% chge av.wk.
Federal $46.4	$532.3	$527.1	+5
State & Mun. 83.9	1,430.7	1,181.8	+26
Total Public $130.3	$1,963.0	$1,708.9	+19
Total Private 84.8	1,816.0	1,624.4	+16
U. S. Total $215.1	**$3,779.0**	**$3,333.3**	**+18**

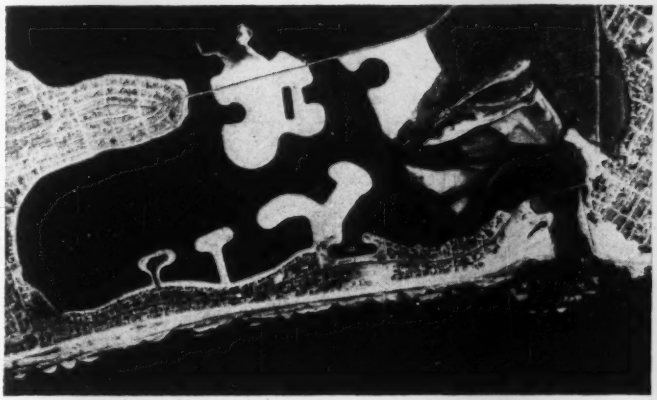
Contracts by type of work

	This Week	Cumulative 1949 (25 wks.)	Cumulative 1948 (26 wks.)	% chge av.wk.
Waterworks	$3.5	$84.5	$98.5	−11
Sewerage	8.9	124.0	102.7	+26
Bridges	3.8	165.0	145.8	+18
Highways	20.6	385.3	479.6	−16
Earthwork, Waterways	16.8	298.6	272.4	+11
Buildings, Public	66.7	775.4	509.4	+58
Industrial	19.7	464.9	521.2	−7
Commercial	59.4	1,150.5	964.7	+24
Unclassified	15.7	330.8	239.0	+43

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (25 wks.)	Cumulative 1948 (26 wks.)	% chge av.wk.
NON-FEDERAL	$2,550.3	$1,824.2	+45
Corporate Securities	1,226.6	972.3	+31
State and Municipal	1,323.7	851.9	+61
Total Capital	**$2,550.3**	**$1,824.2**	**+45**



SAND MOVEMENT STUDY—The Beach Erosion Board of the Corps of Engineers has undertaken to determine rate, direction and effects of sand movement at Mission Bay, Calif. Effects of jetties on erosion or accretion of shoreline sands will be recorded by hydrographic and topographic surveys; sampling of beach and bottom; aerial photos; and daily weather tide data.

ENR in microfilm is available to libraries

The McGraw-Hill Publishing Company, 330 West 42nd Street, New York, N. Y., has entered into an agreement with University Microfilms, Ann Arbor, Mich., to make available to libraries issues of a number of McGraw-Hill publications in microfilm form. ENR is one.

Under the plan, the library keeps the printed issues unbound and circulates them in that form for from two to three years, which corresponds to the period of greatest use. When the paper copies begin to wear out or are not called for frequently, they are disposed of and the microfilm is substituted.

Sales are restricted to those subscribing to the paper edition, and the film copy is distributed only at the end of the volume year.

The microfilm is in the form of positive microfilm, and is furnished on metal reels, suitably labeled. Inquiries concerning purchase should be directed to University Microfilms, 313 N. First Street, Ann Arbor, Mich.

CAA prints new edition of "Airport Design"

A new edition of "Airport Design," just issued by the Civil Aeronautics Administration, gives up-to-date information on all features of airfield planning.

The pamphlet covers broad general principles and, in addition, emphasizes important preliminary steps such as (1) determining the size and type of airport to be constructed and (2) selecting the site. Other chapters present the fundamentals of airport layout, plans and specifications, and details of design. The book also contains chapters on heliports and seaplane bases.

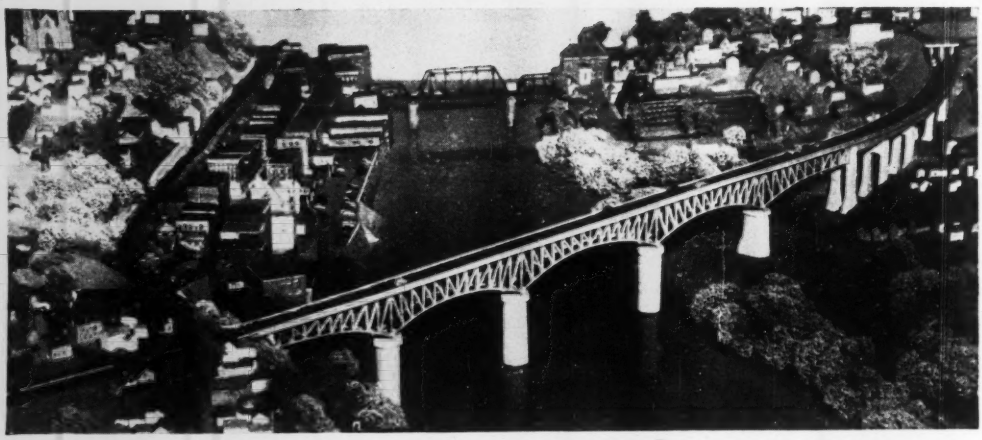
Illustrations include drawings of a variety of model airport layouts for both large and small fields, with charts and graphs on related subjects. The text discusses soils, paving, drainage, lighting, turfing and other items important to construction.

Priced at 30¢ per copy, "Airport Design" is available from Government Printing Office, Washington, D. C.

Sanitary and public health engineer roster started

The American Public Health Association, in cooperation with the National Security Resources Board, is preparing a roster of sanitary and public health engineer citizens of the United States. This roster, to a great extent, will supplement and bring up to date the roster prepared by the War Manpower Commission.

The immediate interest of the National Security Resources Board in such a roster is to provide a means by which trained sanitary and public health engineers can be assured of proper utilization of their professional training should another national emergency arise. The Engineering Section Project of the American Public Health Association is directly responsible for preparation of the roster.



THE NEW BRIDGE across the Kennebec River at Augusta will look like this model and solve traffic bottleneck.

Congestion-Relief at Maine's Crossroad

Howard B. Fleming
Construction Superintendent,
W. H. Hinman Inc.
North Anson, Maine

A GLANCE at a map of the state of Maine will show that most of the main north-south and east-west highway routes go through Augusta. This traffic, especially heavy during the tourist season, for years has been funnelled through the capital city's shopping district and across an entire inadequate Kennebec River bridge, built in the early 1900's for a "streetcar and a load of hay." The condition had to be corrected.

A high-level crossing downstream from the present bridge was designed by the Maine State Highway Commission and let to contract in 1948. Nearly a mile long, this bypass will require removal of about twenty buildings, including two small hotels and a large super-market. The bridge is to be 2,093 ft. long, with a 28-ft. roadway and two 6-ft. sidewalks. The ends are at nearly the same elevation, giving a practically level crossing. The deck is 100 ft. above the stream.

Foundations consist of ten piers and two abutments. Seven of the piers are on shore, and three in the river. All but two of the foundations are on steel piles—these being on ledge and on gravel, respectively.

The river piers are of unusual design: Because of extreme ice conditions, it was felt necessary to have the piers parallel to the line of flow. However the bridge is on a 35-deg. skew, and in order to take the truss bearings, the piers were widened to twenty feet on top. Since the piers are about sixty feet high from bottom of seal, they require nearly 2,000 cu. yd. of concrete each. The bridge runs straight from abutment 1 to pier 6, then, the next five spans are on a 5 deg. 24 min. curve. Abutment and pier numbers run from left to right on photograph of model above. The model, built in two vertical to one horizontal proportion, gives an accurate picture of the completed project and of the present difficulties with the old crossing.

The main river spans are of deck cantilever design. Suspended trusses bear on piers 1 and 6, and another closes the 350-ft. span between piers 3 and 4. The 300 ft. between 2 and 3 and, that between 4 and 5 are anchor spans.

Construction began in 1948

Contracts for the substructure and steel for the new bridge were let in the spring of 1948, with W. H. Hinman, Inc. of North Anson, Maine, low on the substructure at $377,000 and American Bridge on the steel at $1,063,000. Steel piling was furnished by the state on an order placed a year previously.

Specifications called for 1948 completion of all foundation structures except the mid-stream pier, with steel erection to start in the spring of 1949. A construction trestle to the remaining pier—to be used by the steel erectors after the substructure contractor had completed his work—was included in the foundation specifications. Because of danger of ice taking out any trestle built the previous year, construction of this pier was begun after the 1949 spring break-up, the pier to be completed by July 15.

Pile-driving started on pier 5—a dry-mass concrete structure—in mid-June, 1948. Pile sizes ranged from 8 in. to 14 in., all steel H sections. Swinging leads with a bottom yoke were used for the land driving, excellent alignment being secured on both plumb and batter piling with this rig. The yoke, fitted with a swinging gate, held the piles with a minimum clearance. In the river piers, piles were racked and driven underwater.

Land piers are double-columned, with an arch between to complete the rigid-frame design. These vary in height from 30 to 70 ft.; they are reinforced with steel up to 1¼" square. Tapered and with recessed corners, all of these piers required accurate form work.

Form-reinforcement preassembly

It was decided to build the form assemblies on the ground, complete with steel reinforcing and all the ties installed, and to erect them with a crane. This method was used first on pier 10 and then on the rest, proving entirely successful. The top illustration at right shows placement of the upper section of one pier-leg.

During fabrication the forms were

laid out on blocking, and the full length of form was built on the ground. In the taller piers the vertical reinforcing steel was spliced about halfway up the legs, which made it possible to cut the forms at the level where the upper end of splicing steel would be.

Pedestal forms were set on the footings, and about two feet of concrete poured as an anchor. The first section of column then was set, plumbed and poured. The concrete was leveled off in the form low enough to allow for splice steel from above and the next day the top section was set on the first section, which was rigid with the set concrete. After placing the concrete in the top section the prefabricated arch form was set and arch steel, which also had been prefabricated, was placed. As the column form sections had been built as one unit and cut in two, little difficulty was experienced in lining and plumbing. No staging was required and the resulting lines were good.

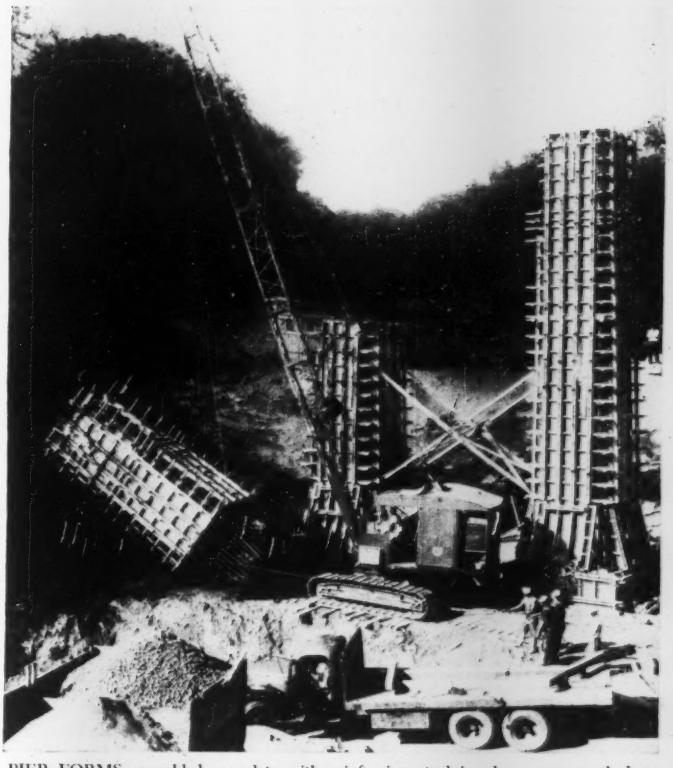
Some of the sections placed weighed between seven and eight tons. A yoke was built on the top of the form to support the steel and keep tension off the form ties and, in the case of the heavier piers, to transfer the weight of the steel directly to the I-beam spreader bar used to lift the sections. The units were picked up by the crane with two lines and then righted in the air. Heavy pad-eyes were bolted to the forms for lifting.

Most other forms also were prefabricated, with some large sections being set for the river piers. Nose sections standing up on both ends of the pier were made in a unit including the coping. The top of this pier is 20 feet wide.

Cofferdamming was done by conventional sheetpiling methods. Seals of about 550 c.y. each went in the river piers, being poured with long-neck submarine buckets to pile-top and then with conventional buckets to the top of seal.

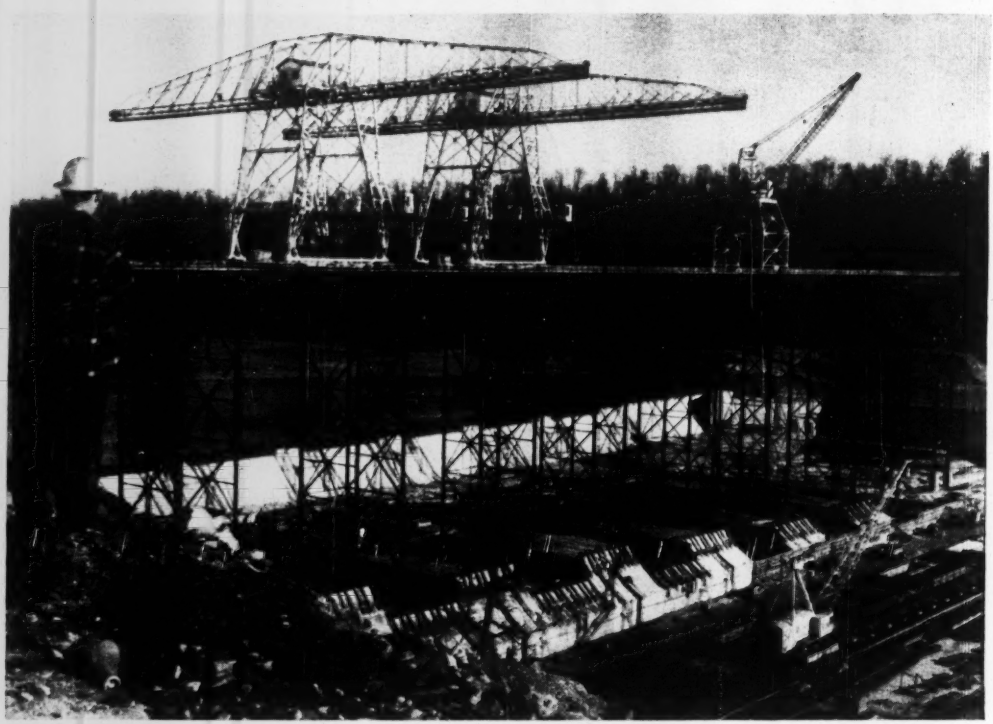
Concrete ingredients were measured out with trolley batchers. Two of these, one of two compartments and one of three compartments, were used. The three-bin unit served a 16S mixer at each end and the two-bin served a single mixer. Bins were charged with a ½-cu. yd. crane and the concrete was handled by a ¾-cu. yd. machine with sixty-five foot boom.

This bridge is being built with federal aid by the Maine State Highway Commission, Lucius D. Barrows, Chief Engineer. Max L. Wilder is Bridge Engineer and Andrew Adams, resident. For W. H. Hinman, Inc. the writer is superintendent.



PIER FORMS assembled complete with reinforcing steel in place, were trucked to footing and hoisted to place with two lines from crane.

SUBMARINE BUCKETS with long necks placed 550 cu. yd. of concrete for each cofferdam seal. Here, two 16S mixers, served by a trolley batcher, alternate in bucket-loading. Second bucket rests at left-hand mixer discharge. (Photos by McKay and Veilleux, Kennebec Journal).



High trestle carries two hammerheads and a revolving crane for concreting . . .

Bull Shoals Dam—Biggest in Arkansas

BIG DAMS call for big equipment and fast-moving, coordinated construction. This is self-evident at Bull Shoals Dam, now more than one-third completed on the White River in northern Arkansas.

Concreting schedules, already stepped up to 100,000 cu. yd. per month, will be increased to a peak of 160,000 cu. yd. per month beginning in April or May of next year. Much careful planning went into the four basic operations (aggregate production and processing, concrete mixing and placement) required to meet such a pace.

Concrete aggregates are quarried 7 mi. from the damsite and transported by endless-belt conveyors to a processing plant set up on the right bank of the river. The concrete is mixed in an automatic batching and mixing plant, transported in 4-cu. yd. buckets, and placed in the forms by two big hammerhead cranes and one revolving crane. The cranes operate on a high-level steel trestle built out from the right bank.

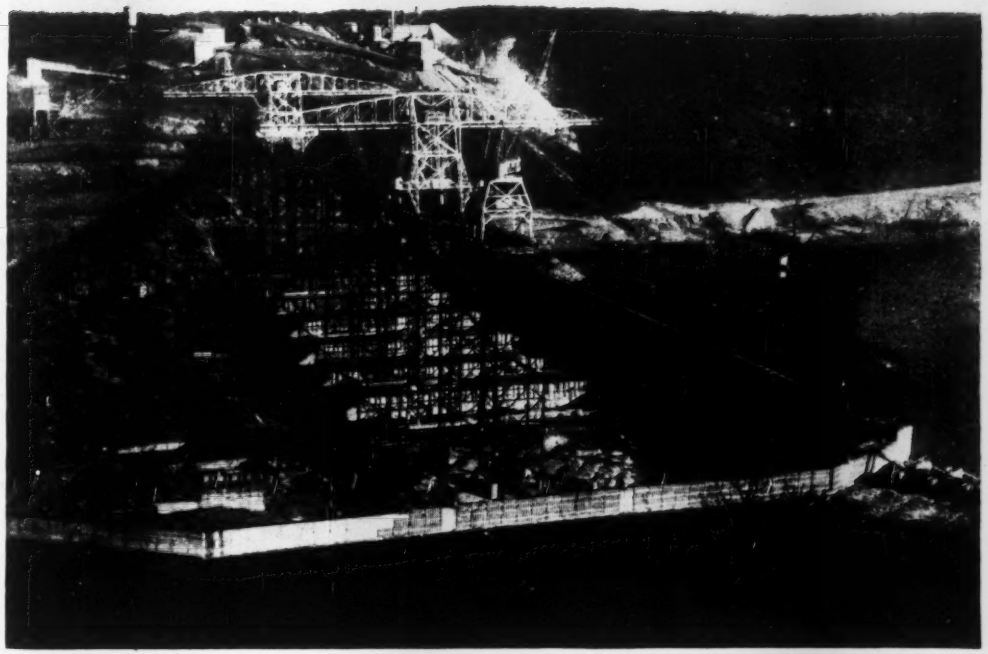
Some of this equipment has quite a history. The hammerhead cranes were first used on the Grand Coulee Dam, then on Friant and Dale Hollow dams (ENR Aug. 6, 1942, vol. p. 193) before being bought for this project. The revolving crane was bought new for use at Friant Dam, sold to TVA, and then brought to its present job. The steel trestle also has a history: about one-half of it was originally used at Friant and then Dale Hollow Dam.

Combined flood-control and power

Bull Shoals Dam is being built by the Little Rock District of the Corps of Engineers, for combined flood control and hydroelectric power. It is a 2,256-ft. gravity-type dam, 283 ft. high, and will contain an 808-ft. central spillway topped by 17 tainter gates. The right abutment will be 508 ft. long, while the left abutment (containing eight 18-ft. penstocks) will be 940 ft. long. A 26-ft. roadway and two 4-ft. sidewalks will extend across the crest. Sixteen 4x9-ft. flood-control conduits will be placed in the base of the spillway section.

When the project is completed in 1952, the reservoir will have a total flood-control capacity of 2,360,000 acre-ft. and an initial average power output—from three turbo-generators—of 135,000 kw. Provisions are being made to add five additional generators for a total rated capacity of 225,000 kw. Water impounded by the dam, at top of flood-control pool, will cover 71,240 acres.

Estimated cost of the entire project



MONOLITHS forming the right abutment and spillway section are being built up inside a huge concrete cofferdam enclosing 18½ acres. Concrete and aggregates plants are on far bank of river.

is roughly $76,000,000. A $22,146,000 contract for construction of the dam, exclusive of furnishing cement and concrete aggregates, was awarded to Ozark Dam Constructors, Houston, Tex. in May 1947. This concern, made up of nine contracting companies, was later awarded a $9,000,000 contract for furnishing the aggregate, under the name of Flippin Materials Co. Total concrete in the dam will be 2,100,000 cu. yd., exclusive of the power house for which a contract is expected to be awarded this year.

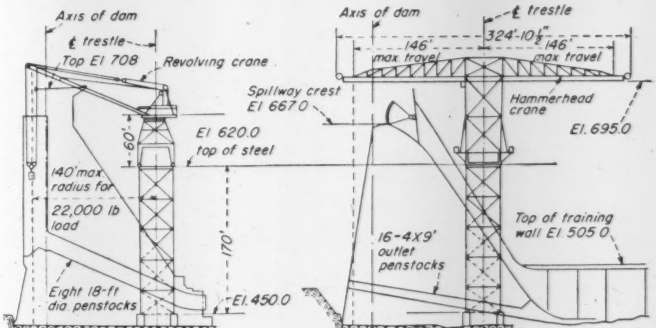
Aggregates are being quarried near Flippin, Ark., crushed to −6-in. size in a 42-in. gyratory crusher and conveyed to a 10,000-ton storage pile. They are fed onto the 7-mi. endless-belt conveyor system from a reclaiming tunnel beneath the stockpile.

Large rock quarry

After stripping overburden up to 60 ft. in depth—40 percent of which was rock that had to be blasted—the contractors opened an 80-ft. face of quarry. Main drilling is being done by three 9-in. electric churn drills. Holes are drilled about 85 ft. deep in staggered rows. They are spaced 33 ft. apart in each row; the rows are spaced 30 ft. apart.

The first row for each quarry blast is drilled 30 ft. from the face of quarry to give 30 ft. of burden. This drill pattern produces 35 cu.yd. of rock per foot depth of hole.

An average 85-ft. hole is loaded to within 20 ft. of its top with 2,000 lb.



SECTION THROUGH ABUTMENTS — SECTION THROUGH SPILLWAY

CONCRETE IS PLACED in the forms by cranes operating on 1,920 ft. of trestle supported on nineteen 170-ft. steel towers. The revolving crane (at left) can pick up 22,000 lb. at 140-ft. radius. Hammerhead crane (at right) has a maximum travel of 146 ft. each way from center line of trestle.

of dynamite—about 200 lb. of 65-percent strength semigelatinous dynamite in the bottom of the hole and 1,800 lb. of 50-percent strength ammonium-nitrate dynamite in the remainder.

Production of rock averages 1.4 cu.yd. (solid measurement) per pound of dynamite. One shot of 54,000 lb. of dynamite produced an estimated 75,000 cu.yd. of stone.

Down on the quarry floor, the blasted rock is loaded into 25-cu.yd., side-dump and 12-cu.yd. end-dump trucks and hauled to the nearby gyratory crusher.

A 5-cu.yd. electric shovel is to be added to the rock-loading equipment, which now includes one 2-cu.yd. and two 3½-cu.yd. shovels. Rocks too large for the gyratory crusher are reduced in size by a crane-operated 4,000-lb. skull-cracker, working on the quarry floor.

7-mi. of endless-belt conveyors

The 7 mi. of endless belt conveyor from quarry to damsite has 21 flights from 600 to 2,800 ft. long. Each is powered by a 100-hp. electric motor. Concrete counterweights suspended from timber towers keep the conveyor belts under proper tension.

The belts travel 525 ft. per min. and can deliver 350 cu. yd. of rock per hour to the 10,000-ton storage pile at the dam. Maximum drop in any flight is 174 ft., the greatest rise is 114 ft. The entire conveyor system drops a net distance of 300 ft. from quarry to damsite.

Concreting at the dam continues 24 hr. per day (six days per week) but the quarry operates only one, two or three shifts per day as needed to keep up with concreting demands.

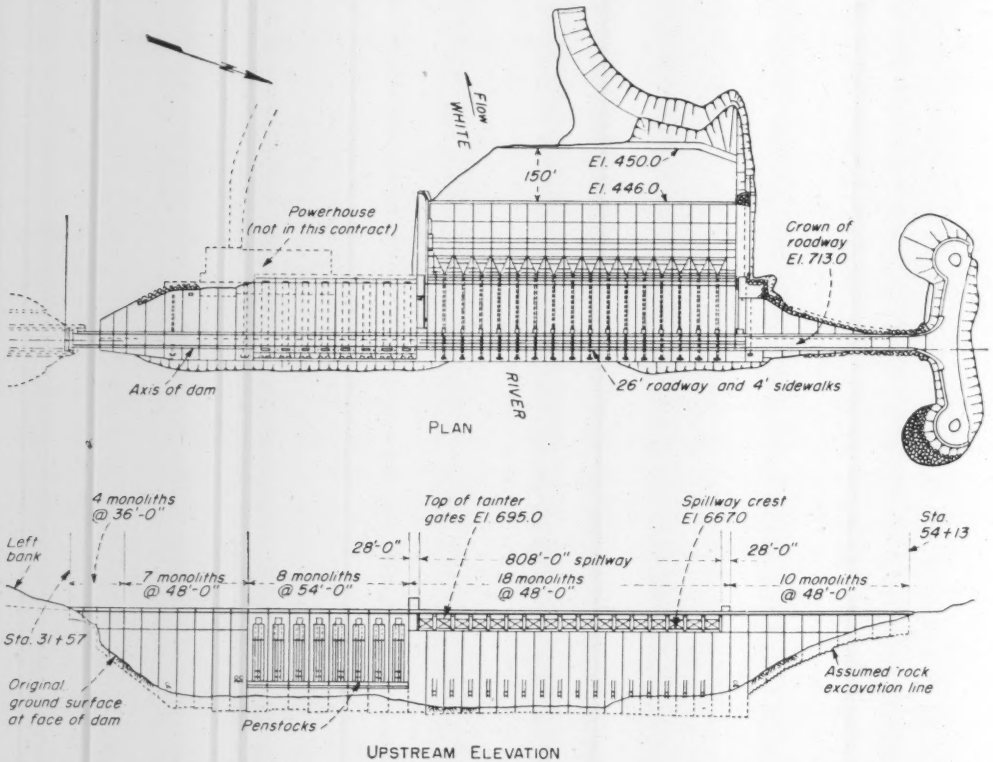
Stone from the reclaiming tunnel under the storage pile goes by belt conveyor through screens and crushers to four storage bins mounted over a second reclaiming tunnel. The four sizes of aggregate in the concrete are 6- to 3-in., 3- to 1½-in., 1½- to ¾-in., and ¾-in. to No. 4.

During hot weather the aggregates were cooled by immundation in eight refrigeration tanks. During cold weather river water is circulated through these tanks to remove frost from the crushed stone.

Sand temperature controlled

A one-size sand is manufactured by hammermills, impactors and screens, from −1½-in. crushed stone. Originally the sand was made in three sizes and blended, but this did not give a concrete of the proper consistency. Excess fines (mostly −200 size) are removed by dust collectors and hauled away by truck. During hot weather sand was cooled by dry refrigeration in tanks surrounded by pipes containing circulating water at 35 deg. F. Maximum and minimum permissible temperatures of the concrete placed in the forms are 65 deg. and 40 deg., respectively.

Aggregates and sand move into the batching and concrete mixing plant on another set of endless-belt conveyors. (There are over 6,000 ft. of conveyor belts in the aggregate plant



FORTY-SEVEN MONOLITHS make up the 2,256x283-ft. gravity-section dam which will have 508-ft. and 940-ft. non-overflow abutments and an 808-ft. central spillway topped by 17 tainter gates.

including the line to the batching plant.) Four 4-cu.yd. stationary tilting mixers are in the concrete plant which is fully equipped with automatic weighing and recording devices.

Cement is shipped in by rail and unloaded into cement silos. Concrete mixes contain 25 percent natural cement and 75 percent portland cement. Addition of the natural cement gives a low heat of hydration, better workability and saves 10 cents per cubic yard of concrete—a considerable saving on the 2,100,000 cu.yd. involved.

Concrete in the interior of the dam has a compressive strength of 1,100 psi. at seven days and 2,200 psi. at 28 days, with a cement yield of 3 bags per cu. yd. Exterior concrete yields 4 bags of cement per cu. yd. and tests 1,700 psi. at seven days, and 3,400 psi. at 28 days. Concrete in the spillway section tests 2,000 psi. at seven days, 2,700 psi. at 28 days, and has a cement yield of 4½ bags per cu. yd. of concrete.

Air-entrained concrete is used in all concrete mixes, the entraining agent being interground with the natural cement. About 6 percent of air is entrapped in the concrete. Steel forms for the concrete are lined with ¾-in. absorptive form liner. All concrete is vibrated internally.

Concrete placed from high tower

One of the most awe inspiring operations on the project is that of placing concrete, in 17 of the huge monoliths being brought up in 5-ft. lifts. All concrete is placed from the steel trestle carried on 170-ft. high steel towers, 125 ft. downstream from the axis of the dam.

The trestle is decked with timber, and carries two lines of standard gage track between the 38-ft. gage track on which the three cranes operate, for transportation of concrete from the mixing plant. Spring switches on the rails shuttle the concrete cars from one track to the other.

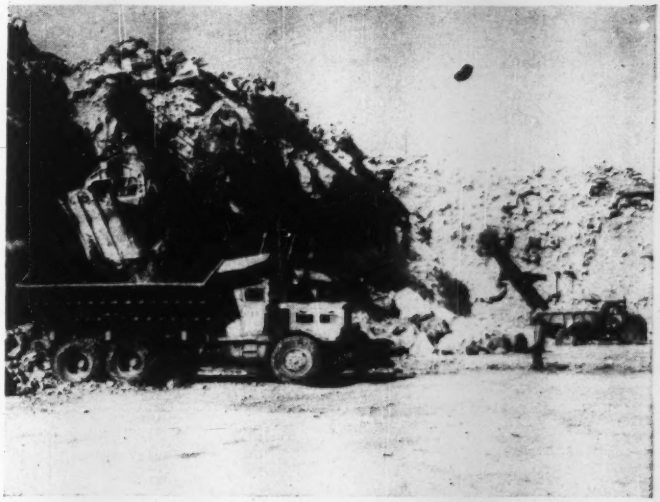
The hammerhead cranes have a maximum travel of 146 ft. each way from the center line of trestle. The revolving gantry crane has a 22,000 lb. lifting capacity at 140-ft. radius. Hoisting speed of the cranes is 750 ft. per min. The cranes operate off a 440-v. hot-rail carried along the upstream side of the trestle.

Only one operator is needed on each concrete car to transport the concrete from mixer to gantry cranes, and to handle the loaded and unloaded buckets at each end of the run. Five cars, each operated by a diesel-powered "dinkey", make up a "train" from the mixing plant. Each car carries four 4-cu.yd. square buckets, with one space for the spare bucket left on the previous run. Under optimum operation the three cranes can deposit 5 cu. yd. of concrete in the dam every 1½ min.

The 25 concrete buckets were built especially for the job. Each is equipped with a roller-type bottom-dump gate actuated by a compressed air line in the forms. The chief requirements in the design of the buckets was rapid and complete discharge of the concrete.

Forms for the concrete monoliths are standard steel cantilever, held in place by anchors embedded in previously placed concrete. Special form jacks permit raising 200 ft. of forms a height of 5 ft. in about 5 min., after all preparations have been made.

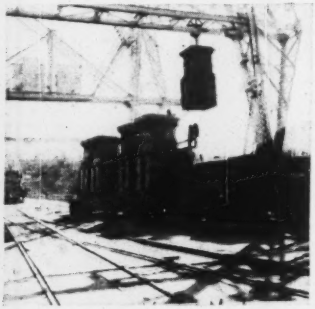
Bull Shoals Dam, exclusive of the power house and appurtenances, was 34 percent completed (dollarwise) on Mar. 24. Concrete placement had reached 280,000 cu. yd. on that date. Concreting has continued throughout



QUARRY ROCK is loaded into 25-cu. yd. trucks (top right), hauled a short distance to a 42-in. gyratory crusher where it is reduced to —6 in. size, and transported to the damsite on 7 mi. of endless belt conveyors (at bottom right).

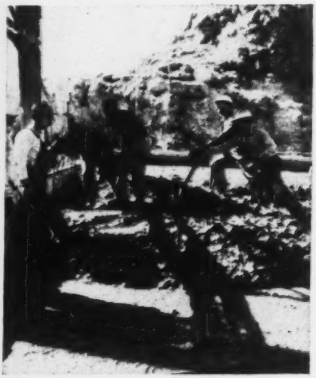
Concrete is mixed in a four-story batching plant . . .

HAULED out onto the trestle in special cars the concrete is . . .



LOWERED BY CRANE and deposited in the forms from . . .

QUICK-DUMPING, easily handled, 4-cu. yd. buckets and . . .



THOROUGHLY VIBRATED in place by waiting crews.

the winter, except when the temperature fell below freezing. The fresh concrete is protected by heavy cotton mats during mildly cold weather and provisions are made for heating the mixing water if necessary.

No provisions, however, were made for heating aggregates and steam-curing the concrete during freezing weather. During those periods the contractors have elected to cease operations for a shift or two, as a point of economy.

Peak employment by the contractors last year totaled 1,500 men in three shifts, including those in the quarry. This crew was reduced to 850 during the past winter, but it will be greatly increased as weather conditions open up this summer.

A substantial engineering crew also is needed to run this huge job. The Corps of Engineers' field force on the dam, including office personnel, totals 94. Of this number, seven are in charge of various divisions of the work. Twenty are directly connected with placing concrete, eight on laboratory and concrete control, four on aggregate production, 15 on surveys and checking forms, and 12 on plans, records and estimates.

Shift-working engineers rotate shifts every two weeks, and the night-work differential in wages amounts to about 10 percent of the base pay.

Engineers in charge

Bull Shoals Dam is being built under the general supervision of Col. Thomas A. Lane, Little Rock district engineer, Corps of Engineers. Lt. Col. Kenneth H. Newton is executive officer. John L. Kemple has been project engineer since March 1, succeeding Ralph Johnson who resigned to serve with the Atomic Energy Commission. Lincoln F. Sherman and Roy F. House are assistant project engineers.

Others in charge of various divisions of the work include: R. M. Cami, field office engineer; D. H. Basgen, inspection; S. A. Myrick, concrete control; J. D. Lunsford, layout and surveys; and R. E. Whitla, foundations.

M. H. Slocum is project engineer for the contractors; Joe Shawver, quarry superintendent, E. Skinnarland, trestle superintendent; and Ed. Shipp, superintendent of placing concrete.

Contractors

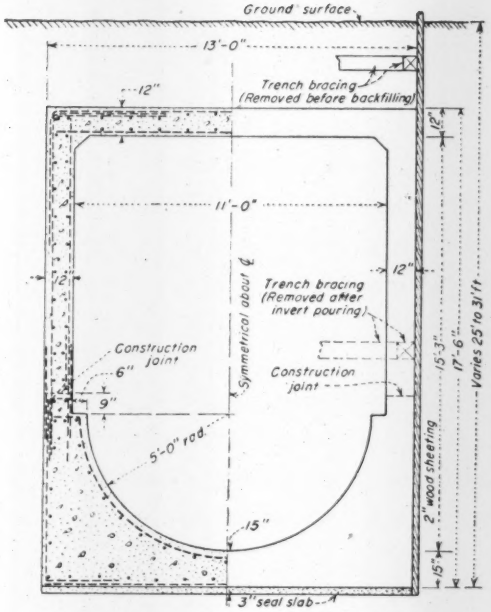
Ozark Dam Constructors is made up of Brown & Root, Houston; Morrison-Knudsen Co., Boise, Idaho; Wunderlich Contracting Co., Jefferson City, Mo.; Peter Kewit Sons Co., Omaha; J. C. Maguire & Co., Los Angeles; Winston Bros. Co., Minneapolis; David G. Gordon, Denver; Condon-Cunningham Co., Omaha; and Charles H. Tompkins Co., Washington, D. C.

Failures of Galvanizing On Steel Pipe Studied

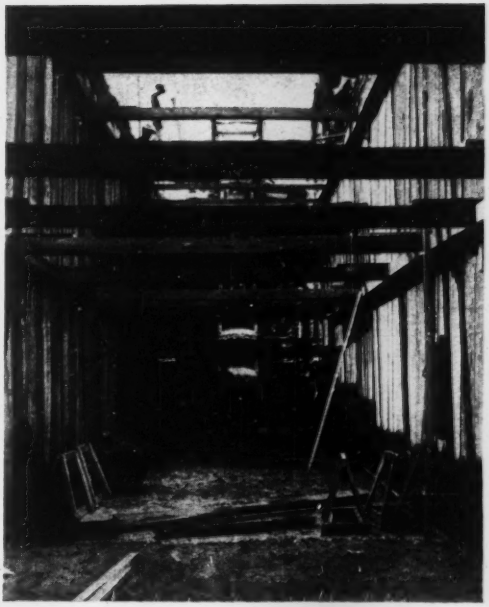
The tendency of the zinc coating or galvanizing on steel pipe to dissolve varies with substances in solution in the water, according to a study by the Committee on Steel Pipe Research of American Iron and Steel Institute. R. B. Hoxeng, research associate of Case Institute of Technology and C. F. Prutton of Carl F. Prutton and Associates, both of Cleveland, reported the first phase of 18-month old project at the annual convention of the National Association of Corrosion Engineers in Cincinnati, Ohio, April 13.

The study was designed to determine causes of exceptions to the usual long life of galvanized-steel pipe in severely corrosive natural waters, and to find means of overcoming this trouble. Ordinarily no pitting of the steel results, because of electrolytic protection afforded by zinc. When zinc and steel are in contact in water, the tendency to dissolve zinc is greater than that of steel. As long as the zinc remains, the steel is protected. Some exceptional cases have been reported, however, in which galvanized steel was pitted in hot water, changing the normal relationship between the two metals.

In studying exceptional cases, it was discovered that bicarbonates and nitrates accelerated the reversal of the normal relationship, while chlorides and sulphates prevented the reversal. For a natural water the probability of reversal of the normal behavior would depend on the relative quantities of these chemicals and to a less extent on the water temperature.



Clever design is coupled with . . .



Smart construction to give . . .

An Economical Storm Sewer

HOUSTON, TEXAS started out to insure an economical job when its new Dowling Area storm sewer was in the design stage. Actual field problems were taken into consideration.

The effort paid off. A contractor recently completed 4,475 lin. ft. of the 11x-15½-ft. reinforced concrete sewer at a cost of only $790,000, and at the rate of 40 ft. per day. A prime factor in the speed of the job was a trenching-machine cut 13 ft. 4 in. wide by 23 ft. deep, which is probably the largest ever excavated by this type of rig.

The first section completed will serve 1,375 acres in the southeastern part of the booming Texas city. Replacing inadequate surface drainage that has caused flooding in the past, the project included the lower end of the drain and an outfall to Bray's Bayou off the Houston Ship Channel.

Sewer design basis was a 1,375-cfs. capacity, and the required gradient put the sewer bottom 25 to 31 ft. below ground. While plans were being drawn, local contractors were consulted to help determine the sewer cross-section that would be most economical to build under the existing conditions.

The soil at the site was a fairly stiff clay with some sand. It seemed ideal for open-cut excavation so tunneling was dismissed as impracticable. Some believed that the cheapest excavation would be by trencher, and that such a machine could be rigged to cut a maximum 14-ft. width. Accordingly, the over-all width for a rectangular box sewer was set at 13 ft. (11-ft. interior plus 12-in. walls) in order to leave some room for trench sheeting.

Made in two pours

Over-all height was made 17½ ft. (15-ft. 3-in. interior, 12-in. roof, 15-in. base). A construction joint in the walls, 7 ft. above the bottom, let the full section be concreted in only two pours. It also simplified trench bracing because two lines of transverse struts were needed, and these could be placed above the joint and above the roof.

The sewer invert is unusual. Although the outside is rectangular, the interior is rounded to a semi-circle of 5-ft. radius. This gave extra mass and strength so that when the concrete had attained a minimum strength of 1,000 psi., the lower line of trench bracing could be removed to leave a clear space in which to build the upper section. The 10-ft. diameter of the invert, with the 11-ft. width of sewer above, left a 6-in. setback along each side for easy support of the upper wall forms.

The sewer was designed with the foregoing construction procedures in mind, but they were not detailed in the plans or enumerated in the specifications. However, the successful bidder on the work took advantage of all the economies they offered.

The trench was excavated by a ladder-type ditching machine that was enlarged and strengthened to cut a 13-ft. 4-in. slot. The machine came equipped with one pair of rotary wideners, and the contractor installed another one on each side to give the required width of cut. The wideners consisted of a series of short, bladed cutting arms clamped to the faces of a square rotating shaft. The shaft was mounted parallel to the machine's

DITCHING MACHINE excavates for the sewer. The big rig has been enlarged to dig a trench 13 ft. 4 in. wide by 23 ft. deep.

STEEL FORMS are assembled for the semi-circular invert. The unusual shape allows lower bracing to be removed after the invert concrete reaches a 1,000-psi. strength.

bucket line on transverse brackets to the ditcher boom. As the shaft rotated, the cutters dug earth from the side of the trench and cast it into the path of the buckets excavating the center section.

The lower end of the ditcher boom was altered also. A cage-like cutting wheel was added to each side of the bucket tail wheel, and revolved with it. A pair of toothed cutting blades parallel to the wheel's shaft excavated the bottom of the trench, while two sets of curved conveying blades moved the spoil to the ditcher's digging buckets.

Although the enlarged ditcher could dig the full trench width, its maximum cutting depth was only 23 ft.—2 to 8 ft. short of that required. This limitation made two-stage excavation necessary: A shallow dragline cut, 30 ft. wide, followed by ditching to grade. The wide top cut gave plenty of working space and permitted dump trucks to operate alongside the ditcher. They received spoil from the machine's cross conveyor, then hauled the material for use as fill over completed sewer pours.

Trench well braced

A temporary trench bracing system of stub verticals and transverse struts was kept close up behind the ditcher in the space over its inclined bucket boom. Steel link fencing on a pipe frame fastened to the boom itself made a safe platform from which to set this bracing. As soon as the full depth was excavated, temporary bracing was removed and the trench was sheeted solid with 2-in. planks. The planking was placed vertically and was supported 9 and 19 ft. above the bottom of the cut by 6x6 and 8x8-in. horizontal wales and cross braces.

Although the ditching machine left a clean and level trench bottom requiring little clean-up, a 3-in. unreinforced concrete slab was poured for a firm base and support of invert forms. The forms were semi-circular sheet steel braced by welded angle ribs. Ten 5-ft. panels were semi-permanently bolted together and handled as a 50-ft. unit for each pour. Long pipe-sleeve turnbuckles spanning the invert between the upper edges of the forms held the panels to the proper shape for pouring. The forms were held in place by 6x6-in. precast concrete blocks on the seal slab, and by short timber struts to the trench bracing above.

Concrete was mixed in a paver on the lip of the trench. A funnel and 6-in. rubber hose supported by a steel frame resting on the trench bracing received concrete from the mixer

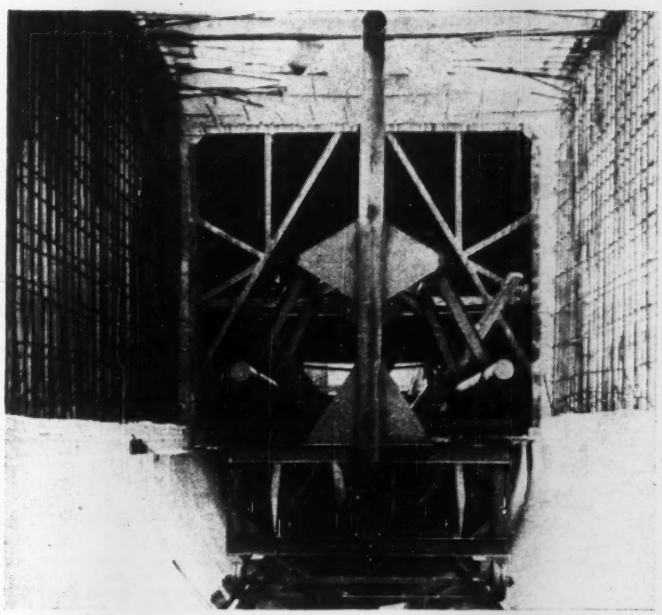
bucket and distributed it to the forms. Since the concrete was a 6-sack mix with a 6-in. slump and 1½-in. maximum size round gravel aggregate, no difficulty was encountered in running it through the hose. When the concrete had set, forms were stripped by retracting the turnbuckles to spring the panels inward. The rear of the form was jacked up to rest on a wheeled dolly, and the entire 50-ft. form unit was skidded and rolled ahead for the next pour.

When the invert concrete had reached its required 1,000 psi. strength (about three days after pouring) the lower trench braces were taken out, and the upper wall and roof pour was readied. Reinforcing steel was placed and tied by men on a scaffolding jumbo that rode on the invert setback provided for upper-form support.

The upper forms were a two-piece steel assembly. Each piece formed a side wall and one-half of the roof. The roof section was supported by welded trussed knee braces to the wall legs to eliminate shoring, and the wall form was wedged in place on the setback. A hinge in the middle of the assembly, on the sewer centerline, allowed the form to be collapsed for stripping.

The forms were handled in 10-ft. lengths by a jumbo that picked them up at the hinge and near the lower end of the knee braces. The jumbo rode rails placed on the sewer invert, and was equipped with two jacks and a ratchet hoist to operate movable pipe arms that lifted and supported the forms during placing, stripping and moving.

Like the invert, the upper section of the sewer was poured in 50-ft. lengths with paver-mixed concrete hosed into place. Forms were stripped when the concrete's strength reached 2,000 psi. (in about seven days). The upper level of trench bracing was then removed and the cut backfilled to complete the project.



A JUMBO handles the hinged forms for the sewer's walls and roof. The forms rest on a setback just below the construction joint, and require no inserts or bolts in the concrete.

The big drain was designed, and its construction supervised, by Robert W. Lee, storm sewer engineer for Houston's Department of Public Works, of which J. M. Nagle is director. The contractor for the job was Thos. Bate & Sons of Houston. O. M. Ward was their superintendent.

Budgets for Recreation Vary Widely in Big Cities

Large cities spend an average of $32,698 yearly for parks and recreational facilities for their residents. On an average, they provide 5.7 acres in parks and playgrounds for every 1,000 of their population, and devote 5.9 percent of their area to recreation grounds.

These statistics came to light in a survey by Long Beach, Cal., of the acreage used for playgrounds and parks and expenditures for recreation by 68 cities in the U. S. of 100,000 to 600,000 population, the American Public Works Association reports.

The average city among the 68 studied has 231,000 population living in a 42-square mile area, or 5,500 persons per square mile. New Orleans covers the largest area of any city in the group, 363.5 square miles, while the smallest — Trenton, N. J. — covers an area of only 7.5 square miles.

Fort Worth, Tex., ranked first in acreage in parks and playfields for every 1,000 population with 40 acres. Lynn, Mass., provides 18.8 acres, and Spokane, Wash., 17 acres. Only fourteen of the cities met recognized national standards of ten acres devoted to recreation facilities for every 1,000 population.

Budgets for parks and recreation facilities varied widely. The median park and recreation budget for the 68 cities was $1.69 per capita yearly. Sacramento's budget for fiscal 1947 was $576,000, giving the city an average of $4.45 for every resident. Glendale, Cal., ranked second in per capita expenditure for parks and recreation with $3.81 for each of its 101,000 residents.

In percentage of city area devoted to parks and playgrounds, Lynn, Mass., tops the list of the cities surveyed with 28.3 percent. New Haven, Conn., with 18.2 percent of its area devoted to playfields ranked second. Other cities that exceeded the standard of ten percent of the city's area for recreation were Ft. Worth, 16.7 percent; Toledo, 15.0 percent; Oklahoma City, 14.1 percent, Flint, Mich., 13.1 percent; Minneapolis, Minn., 13 percent; Reading, Pa., 12.4 percent; Syracuse, N. Y., 11.6 percent; Wilmington, Del., 11.5 percent; and Youngstown, O., 11.4 percent.

Seattle had the largest budget appropriation for parks and recreation—$1.4 million, a per capita expenditure of $2.56. Kansas City, Mo., ranked second with a total expenditure of $1.2 million, a per capita average of $2.49.

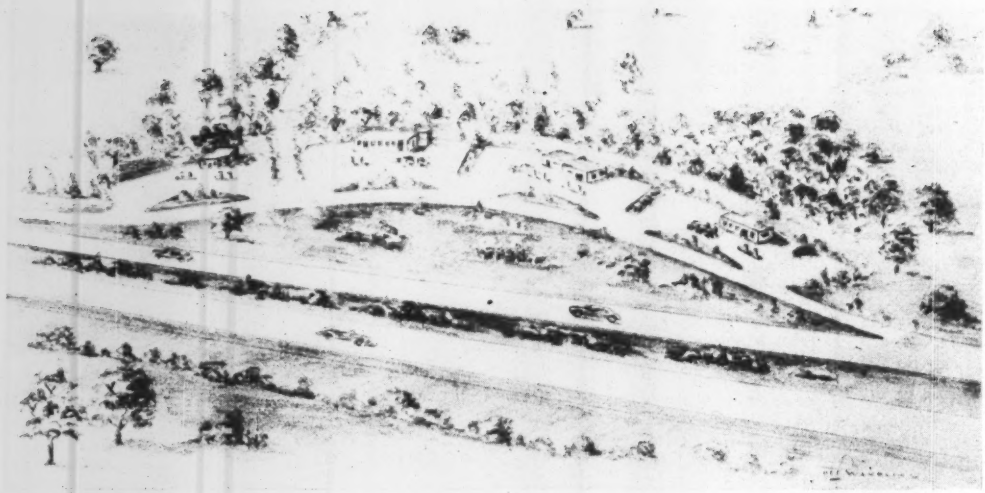


FIG. 1—PROPOSED ARRANGEMENT of service stations on one of the limited-access parkways in New Jersey.

Service Station Facilities for Limited-Access Highways

Ralph L. Fisher
Engineer of Design
New Jersey State Highway Department

LIMITED access highways—with provision for entrances and exits only at predetermined locations—introduce problems of service facilities for motorists. The adjacent landowners do not have access to this type of highway, and private interests can not develop gasoline stations or other roadside establishments. Therefore service facilities must be provided for in the design of the freeway or parkway.

This requirement places the highway engineer in a design field where he has had little experience and where there are limited data available for his guidance. On the other hand, it gives him an opportunity to design service-station areas as an integral part of the highway and to select sites, from the viewpoint of safety, service and convenience, that will best serve the public.

In the past, the policy in most states has been to lease the gasoline-station areas along freeways and parkways to the highest bidder. This has generally resulted in one oil company obtaining the concession for the entire highway, thus creating a monopoly under which but one brand of petroleum products is available to the public. This practice has been objected to from several quarters.

New Jersey service-station act

To meet these objections, the legislature of the state of New Jersey, in an act authorizing the State Highway Commissioner to purchase land for service-station areas on freeways and parkways, required that enough land be purchased to permit the construction of more than one service station in each area. That act was approved by Governor Driscoll on Oct. 28, 1948. Some of its more important provisions are quoted below:

The State Highway Commissioner—in order to permit the establishment of adequate fuel or other service facilities by private owners or their lessees, for the users of a freeway or parkway—may acquire suitable areas for such facilities even though such areas are not needed for the right-of-way proper and, in the manner hereinafter provided, shall sell such portions thereof as in his judgment the public interest shall then require.

Subject to the conditions and restrictions imposed by this act, the premises shall be sold at public sale to the highest responsible bidder.

The commissioner shall have the right to incorporate in any deed conveying premises so sold covenants running with the land requiring the purchasers, their grantees, and successors (1) to erect and maintain any buildings thereon in conformity with specified exterior design, (2) to provide services reasonably required by the users of the freeway or parkway subject to usual sanitary and health standards, and (3) to conduct no business other than that for which the property was originally sold, without the written consent of the commissioner.

Such premises shall not be sold to a person who owns, directly or indirectly, or holds under lease any premises in the same service area on the same side of a freeway or parkway purchased for a similar purpose.

In acquiring areas for the purposes aforesaid and in subdividing such areas into smaller premises for sale to the purchasers thereof, the commissioner shall provide a sufficient number of separate premises to encourage free and open competition among all suppliers of each service involved who desire to purchase premises for the furnishing of such service along each freeway and parkway, subject to any restrictions hereinabove stated.

It is the intention of this new policy to provide the best standards of service and safety to the motorist by proper location and design of service facilities, and to allow him a freedom

of choice as to the product he wishes to purchase.

Factors affecting station location

Service facilities should be located in areas where they can be seen well in advance by the motorist. A location on a moderate down grade and on either tangent alignment or easy curvature would enable a driver to see the facilities in advance and allow him ample time to make a decision. The descending grade would also enable vehicles entering the main roadway from the service area to quickly gain cruising speed. Locations near a crest of a hill, on sharp horizontal curvature, or a steep ascending grade or just beyond an overpass or other places with restricted sight distance should be avoided if possible.

A location near an existing water main, sanitary sewer, telephone and electric service also is desirable.

In order to best serve the public, it is believed that service areas should be located between highway interchanges. Service facilities are generally available on the local road near the interchange and can be used by the through driver in case of necessity.

Stations in a center island

A half section for a service station located in a center island is shown in Fig. 2. Such a location has the advantage of serving the traffic on both roadways. However, this consideration is not believed to be important as most limited-access highways would carry sufficient traffic to support a station at each side of the road, either directly opposite one another or staggered.

The dimensions shown in Fig. 2 are believed to represent minimum conditions. Even with these minimum dimensions there would have to be 214 ft. Between roadways. Few highways have center islands this wide, so the roadways would have to be spread out at the service station area. Also, since freeways and parkways are constructed to high standards of alignment, a considerable distance would be required to accomplish this widening. In cut or fill areas this increase in the width of the main roadway cross section would considerably increase the cost of construction. It is also almost a certainty that one or more bridges would occur within the widened area.

A location in the center island would also require all traffic using the facility to leave the main roadway from the left-hand lane. On leaving the station, the driver would have to merge with fast traffic in the left-hand lane. This traffic would be on his right or what is commonly known as the "blind side." Another disadvantage is that the entrance road to the station would be almost straight. It would not be feasible to introduce curvature sufficient to force a reduction in the speed of entering traffic.

A center-island location makes it impossible to place service stations on a moderate down grade for both directions of traffic; a down grade for one direction would be an up grade for traffic on the other side of the island.

Stations on the right side

A station at the right side of the road (in the direction of traffic) has the advantage that traffic enters and leaves the highway from the right-hand lane. Traffic speeds in this lane are generally lower than in the left-hand lane.

The alignment and grades of the entrance and exit roads can conform to the lower ramp standards rather than main roadway standards. This makes it much easier to adjust the position and elevation of the service station area to site conditions.

Stations on dual-dual highways

On dual-dual highways such as the freeway in New Jersey known as Route 100 (ENR Jan. 23, 1947, p. 120), service stations must be located so as to serve eight lines of traffic. Four possible solutions are shown in Fig. 3. On these dual-dual highways the four inner lanes are for through traffic and the outer lanes are for local movements. Median zones separate opposing traffic movements in the inner lanes and separate through lanes from local lanes.

Arrangement No. 1 would necessitate the least amount of weaving on the part of a motorist stopping for service, but it would require the construction of three stations and purchase of a right-of-way width that presumably would be prohibitive.

Arrangement No. 2 would reduce the number of stations to two, but still would require too wide a righ-of-way. There would be some undesirable tunrning movements.

Less right-of-way would be required by arrangement No. 3, but such a location would result in a large amount of traffic friction. This arrangement would require local traffic to cross both lanes of through traffic before entering the deceleration lane to the service station and then again cross both lanes of this traffic after leaving the acceleration lane from the station. Crossovers would have to be well in advance of the station.

The best practical arrangement is No. 4, in which the service stations are on the outside of each local roadway. This is the layout that has been adopted for Route 100 in New Jersey. One of its main advantages is that it requires no change in the normal roadway alignment. It also fits in with the stage development which calls for only the local roadways to be paved initially.

Only one crossover from the through lanes is required by this layout: vehicles entering the local lanes to reach a service station can stay in those lanes until the next normal crossover is reached.

In actual practice service-station areas seldom will be placed exactly opposite each other, as shown in No. 4. A staggered arrangement is preferable. For one reason, such a layout will facilitate putting as many stations as possible on slightly descending grades for the traffic being served.

Number and spacing of stations

Gasoline stations serve the public in many ways. Besides the sale of petroleum and automotive products, they make emergency repairs, fix flats, put on chains and provide telephone and rest-room facilities. Many people dislike to drive on a highway where these services are many miles apart. While driving along such a highway we have probably all heard the remark "This would be a poor place for

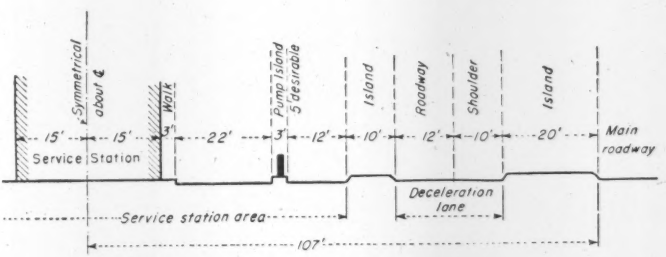


FIG. 2. MINIMUM DIMENSIONS for a service station located in the center island of a divided highway.

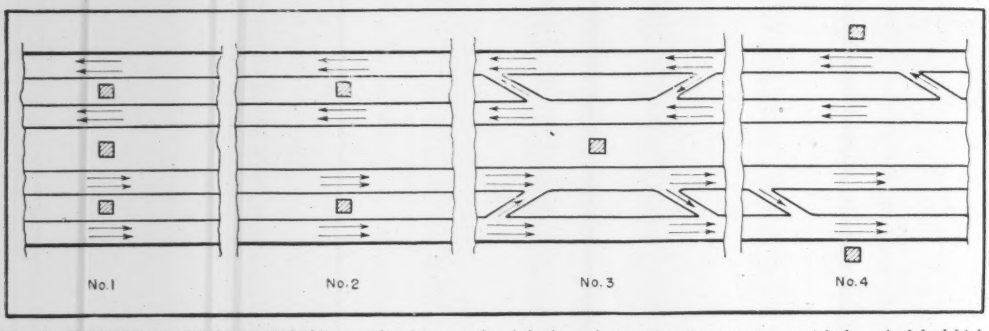


FIG. 3. SERVICE STATION POSITIONS considered in a study of the best placing of station to serve an eight-lane dual-dual highway to which access is limited.

a breakdown." Even though a motorist may not need these services at the moment, the fact that they are available within a reasonable distance, if needed, is reassuring and adds to his peace of mind.

The average age of the population is increasing. This means that each year there is a higher percentage of elderly drivers. The percentage of women drivers is also increasing. Many motorists are physically unable to change a tire. Very few drivers have the know-how or tools to make even minor repairs to the modern automobile.

For the above reasons it is believed that smaller groups of stations spaced closer together would serve the public better than larger groups spaced further apart. For the same reasons when stations are located at the side of the road they should be staggered rather than directly opposite one another.

Knowing the volume and types of traffic that will use the highway, the length of the highway and the fuel consumed per mile by the average automobile and truck, it is a simple matter to compute the number of gallons consumed by traffic using the highway. In order to compute the service station facilities that will be required it is also necessary to know what percentage of the fuel consumed will be replaced at the service stations on the highway under consideration.

The percentage of fuel that will be replaced depends upon many factors, some of which are difficult of accurate appraisal. The importance of the individual factors will vary for different highways and even for different sections of the same highway. They are also affected by local driving customs and habits.

Some drivers are reluctant to use such services as telephones or rest rooms unless they make a purchase. The percentage of drivers desirous of using such services would thus have an effect on the volume of business. Many of the long distance travelers will want to stop at a service station to get a few minutes rest and to "break up the trip." On the other hand, the short-distance traveler may have quite different buying habits, especially commuters in a hurry to get to work.

To a limited extent, the volume of business will depend on the brand or brands of fuel being sold. Some brands have more general consumer acceptance than others.

Probably the most important factors for limited-access highways are the general appearance of the station, ease of entrance and exit, available parking space, clean rest rooms and courteous, efficient service by the employees.

On one of the longest of the existing limited-access highways, approximately 100 percent of the gasoline consumed by vehicles using the facility is replaced at the service stations along that highway. On other similar highways the percentage replaced is considerably less than 100. This is believed due to lack of adequate facilities and to low standards for some of the elements mentioned above.

Provisions for expansion

Limited-access highways are usually designed so as to be able to serve the traffic that may be expected 30 years hence. In designing service facilities for freeways and parkways it is believed that sufficient area should be acquired to provide for replacing 100 percent of the fuel that will be consumed by vehicles using the highway at the end of the 30-year period. Initially only that part of these facilities needed to serve present day traffic will have to be constructed, but there should be sufficient area to take care of necessary future expansion.

Number of service stations

It has been pointed out that stations should be fairly close together in order to serve the public, yet care must be taken not to install so many stations that none of the operators can make a profit. If the business is not profitable it is almost a certainty that the station will be allowed to run down and the services rendered to the public will be of low quality.

There are over 10,000 gasoline stations in New Jersey. The average sales per stations are about 6,700 gal. per month. With this volume of business and the usual amount of sales of ac-

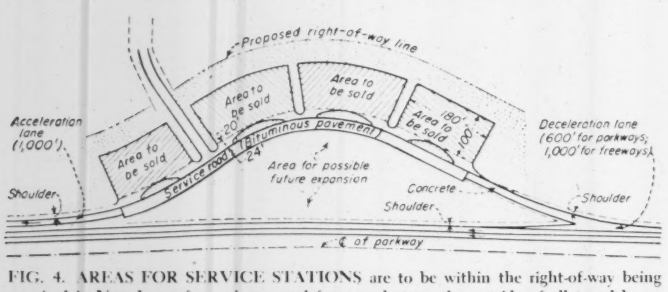


FIG. 4. AREAS FOR SERVICE STATIONS are to be within the right-of-way being acquired in New Jersey for parkways and freeways but on the outside of all travel lanes. Preferred positions are on a slight downgrade for approaching traffic.

cessories such as tires and batteries, the average station can make a reasonable profit. However, it should be remembered that this is for the average station and for average cost of construction and operation. If anything is done to increase the average cost of operation or construction, (such as requiring the erection of an expensive type of building), the volume of sales would have to be sufficiently greater to cover these increased costs.

Station must handle peak demand

The facility must also be large enough to take care of peak demands. Most people will not stop at a station where there are vehicles already waiting to be served.

It takes an average of six minutes from the time the customer drives up to the pump to the time he leaves. During peak demands, a two-pump island can take care of a maximum of about 20 passenger vehicles per hour.

The average driver buys six gallons of gasoline at a time. This figure varies somewhat with changes in economic conditions. Accurate data are not available for average sales on limited-access highways, but the amount of the average sale on such facilities is probably somewhat higher.

The maximum number of gallons per day that can be sold by any one pump will depend mainly on the "spread" of the customers. If the business is uniform throughout the day, the maximum possible sales per pump will be higher than for a condition where most of the customers are served during a relatively short period of time. The maximum sales per day for any one pump will generally vary from about 300 to 500 gal. per day.

There is considerable variation in the number and arrangement of pumps on pump islands at existing stations. It is the consensus of the petroleum industry that for most stations, two islands with two pumps each, give the most efficient arrangement for handling traffic and this arrangement is generally being used at their newer stations.

Service-station areas

A typical layout for a proposed gasoline station area on one of the parkways being built in New Jersey is shown in Fig. 4. Six lots are provided at each location. It is planned to sell four lots initially and hold two in reserve for future expansion.

The interior lots have 200-ft. frontage and the end lots 190-ft. frontage. Interior lots are made longer to provide a minimum of 20 ft. of grassed area between lots. This was done to avoid the appearance of a continuous paved area and to allow space for landscaping.

The lots will have a minimum depth of 100 ft. In addition there will be a minimum width of 50 ft. from the back of each lot to the right-of-way line to allow room for landscaping.

As the owners of the lots will be in competition with one another, restrictions will be placed on the size and locations of any signs, fences, hedges, landscaping or other items that might affect the sight distance. This will be done in order that all stations would be equally visible to the public and to control the general appearance.

An access road will be provided at each area for deliveries and other services. This will eliminate the necessity of delivery trucks using the parkway and will provide a convenient access for utility lines.

At areas where erection of a restaurant might be profitable, all six service-station areas will be located on the outer side of a longer curved roadway, leaving the inner side for a restaurant.

The service areas on the Route 100 freeway are still being studied. Their general layout will probably be similar to the ones on the parkway. However, any station that serves trucks would probably require a minimum length of lot of 250 ft.

These studies for the location of the service stations are under the direction of Spencer Miller, Jr. commissioner and Charles M. Noble, state highway engineer.

Wild Vegetation Wastes Valuable Irrigation Water

Nature is wasting about 28,000 acre-feet of water each year in lower Safford Valley, Ariz., according to a recent U. S. Geological Survey report. Enough to irrigate 9,000 acres of farm land, the water is picked up by wild natural vegetation on 9,300 acres of bottom land along Gila River in Arizona. The vegetation is mostly saltcedar, cottonwood, willow, and baccharis—serving little beneficial purpose.

On the basis of this and other studies, it is estimated that millions of acre-feet of water are wasted annually by non-beneficial vegetation in the western United States.

The amount of water used by different kinds of vegetation growing in Safford Valley was determined during the investigation. In areas of thickest growth, saltcedar consumed 7.2 acre-feet of water per acre per year; cottonwood—6.0, baccharis—4.7, and mesquite—3.3.

Much water now wasted by natural vegetation in Safford Valley could be saved and made available for beneficial use by clearing bottom land. The water saved could be used to grow profitable plants—such as alfalfa—on cleared land, or it could be used to irrigate other lands.

Quality of water in lower Safford Valley was also studied. Dissolved minerals in ground waters in bottom-land area ranged from 200 (good water) to more than 10,000 parts per million (water too poor for irrigation). Ground water that seeps into Gila River includes some water with the higher concentrations.

During the year ending Sept. 30, 1944, the load of dissolved minerals carried by the river ranged from 84,100 tons at Solomonsville, at the head of Safford Valley, to 105,000 tons at Calva, at the lower end of the valley.

The report describes six methods by which water waste was computed as 28,000 acre-feet a year. It also indicates that about 5,000 acre-feet is supplied directly from rainfall, remaining 23,000 acre-feet being supplied by ground water.

Included are descriptions of new techniques developed for field application. The fact was established that some species of bottom-land vegetation transpire water at night. Measurements were made of the transpiration rate. A method, known as the volume-density method, was developed by which relative amounts of water transpired from areas containing different densities of bottomland vegetation could be estimated.

The investigation was carried out by the U. S. Geological Survey in cooperation with the Defense Plant Corporation. The report, "Use of water by bottom-land vegetation in lower Safford Valley, Ariz.", was written by J. S. Gatewood, T. W. Robinson, B. R. Colby, J. D. Hem, and L. C. Halpenny, all of the Geological Survey. Typewritten copies are available at the Geological Survey, Washington, D. C., Albuquerque, N. Mex., Tucson, Ariz., and Los Angeles, Calif.

FIG. 1. STADIUM DECK that was repaired by adding a waterproof membrane and a second deck, heaved and cracked.

Deterioration of Concrete Stadiums Can Be Avoided by Good Design

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Consulting Engineer
New York, N. Y.

EXPERIENCE with the repair of reinforced concrete stadiums at Princeton University and Philadelphia, and the erection of a stadium at Rutgers University, furnishes a guide to the construction of concrete stands that can successfully weather winter exposures.

It shows that expansion cracks must be avoided, water must be prevented from reaching the reinforcing steel and concrete must be of high quality.

The Palmer Stadium at Princeton—one of the early concrete structures (1916)—while defective in many respects according to modern standards of design and construction, has nevertheless maintained its structural integrity. Other examples are the Yale Bowl and the Cornell Crescent.

The Philadelphia Municipal Stadium—of much later date—was designed with adequate expansion, but faulty foundations. It is not up-to-date in reinforced concrete design.

The Rutgers Stadium is a good example of a reinforced concrete structure that has stood up in a northern climate.

Typical stadium deterioration

Reinforced concrete stadiums have suffered a black eye due to deterioration, especially north of the frost line. Perhaps the best way to present the causes of this deterioration, and draw an object lesson therefrom, is to give a composite picture of several of the older stadiums in the north that have deteriorated badly. Our composite stadium, then, is a horseshoe-shaped, monolithic oval of reinforced concrete between 1,000 and 1,500 ft. long, without any expansion joints.

Naturally, the concrete of this structure forms its own expansion joints by cracking, and where cracks occur, water reaches the reinforcing steel and corrodes it.

The steel also is exposed to corrosion in many places because it comes close to or actually touches the outside surface of the concrete. In addition, it corrodes where it passes through construction joints, which open up and let water through. Corroding soffit reinforcement in the deck, risers, treads and promenade slabs explodes the protective concrete, and the reinforcing there rusts rapidly (Fig. 2).

Expansion damages the structure seriously: In some cases, where bracing has been introduced, it restrains the columns so that they cannot give and some of them shear off.

Expansion of the long runs of deck slabs warps and cracks the wing walls at the ends of the horseshoe. Expansion breaks beam-to-column connections by racking, as in the case of the

transverse beams supporting the vomitories where they frame into the vertical columns. Here new collar seats have to be constructed to support the beams and reinforce the column.

Water running down the vomitories enters the transverse construction joints. The reinforcing steel rusts, and serious damage is suffered by some of the supporting sloping beams and the abutment beams of the vomitories where the runways spring from the ground.

Attempts at repairs

As a corollary to this sort of damage is a long history of attempts at repairs. This composite stadium, in many places, is losing its structural integrity. The early efforts made to repair it were as defective as the original design.

In one case, a section was repaired by guniting over the treads and risers. The gunite, which was 1 to 1½ in. thick, was well bonded to the old concrete. However, the original construction joints and expansion cracks—which were numerous — opened up through the gunite surface. Frost enlarged the cracks. Water came through and attacked the steel. The reinforcing bars split off the encasing concrete and were necked considerably, not only by corrosion but also due to concentration of expansion stress on this steel.

Where not hampered by special resistance, the structure had a fan-shaped

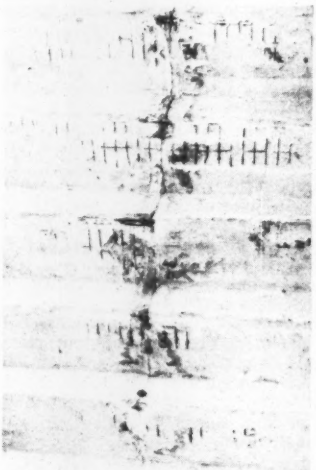


FIG. 2. CORROSION of reinforcement along a construction joint explodes protective concrete.

FIG. 3. CONCRETE COLUMNS were distorted (arrow) by differential settlement.

expansion, since the high columns were very flexible and rigidity increased toward the barrier wall at field level. Without expansion joints, serious stresses were set up.

To relieve these stresses near the bottom of the stadium, attempts have been made to free the bottom from the ground by means of rollers. Rollers have not worked well in practice, and indeed, they should not be necessary if sufficient transverse joints are provided.

Attempts have been made to prevent water coming through the deck slabs by covering the deck with a membrane. This is an excellent approach. However, in some cases the method has been abortive because of an attempt to build a new reinforced concrete deck on top of the membrane. Water entered the joints, penetrated between the membrane and the upper deck, and finally was trapped on top of the membrane all the way down the structure. When this water froze in the winter, it either heaved the new treads or else buckled the old ones—usually the latter. A typical effect was a longitudinal crack in the outer riser due to heave.

The artesian action of the trapped water, plus the fact that the top concrete could not dry out readily on account of the membrane, aggravated the action of frost (Fig. 1).

The disintegration of these decks has been fought annually by chipping and repairing the surfaces of the treads and risers with cement. Nevertheless, some water will continue to come through. Of course, this operation of repairing the deck with cement has been carried on simultaneously with repairs of structural members which have become deteriorated from frost action or from expansion racking, or both. The annual bill for this kind of work has been very high and as pointed out below, is entirely unnecessary.

It is safe to say that if the proper methods are used before the distintegration has destroyed the integrity of this composite reinforced concrete structure, it may be put in condition so it will continue to serve with little or no upkeep for decades.

Repairs on Princeton Stadium

The stadium at Princeton, which in some respects falls in the class of our

FIG. 4. GIRDERS were cracked due to column settlement and water leaked through.

composite stadium, has been partly repaired along modern lines, in this manner:

In 1939, the author directed the repair of the southwest tangent as follows: The tangent was separated from the main horseshoe by cutting a joint. All disintegrated reinforced concrete in this tangent was cut out, corroded steel was repaired and the concrete covering of steel was restored. A 5-ply membrane composed of a steep roofing pitch was placed over the entire deck to exclude water. A series of redwood slats were added to the treads to protect the membrane, since, in this stadium, the patrons sit directly on the steps without seats. These slats included 3 x 14-in. riser beams, which served to protect patrons from possible contact with tar.

In spite of disintegration and occasional racking and rupture due to lack of expansion, the main working members of the structure have stood up surprisingly well. Tests on this old concrete indicate a strength of 2,000 psi.—very good for concrete of the period in which it was placed.

The tangent that was cut off has not required further repairs within the past ten years. In fact, the space underneath this area was sufficiently dry to permit its use during the war as an experimental laboratory.

Foundation trouble at Philadelphia

The case of the Philadelphia Municipal Stadium was somewhat different. Designed with adequate expansion joints and well constructed, except for placing of some reinforcement too near the surface, the stadium was built on cast-in-place concrete piles driven into an alluvial soil of sand, clay and silt. The site is adjacent to the Philadelphia or League Island Navy Yard, and to the Hog Island area, where pile foundations used on buildings constructed prior to the Municipal Stadium proved precarious.

A deep gully, which had been filled with unstable detritus, extends across one end of the stands, and here serious settlement occurred, amounting to more than a foot for many piles.

To appreciate the effects of this settlement, it should be noted that this stadium was divided into rectangles of 40 x 60 ft. so that plenty of provision was made for expansion. However, relative settlement between columns within the same rectangle would cause great stresses in the columns due to the rigid connections of the connecting beams (Fig. 3).

In general, the greatest settlement occurred on the line of the heavy exterior arcade wall. This caused the rafter beams between the wall and the adjacent line of columns to act as cantilevers in a way for which they were not reinforced. The beams cracked, the deck slab cracked, and so did the pile caps (Fig. 4).

It is interesting in diagnosing this trouble to note that about 30 ft. of fill was placed along the rear wall to provide access to the main concourse. Contrary to what ordinarily might be expected, settlement of this fill, which gripped the columns and undoubtedly added to the load on the piles, was diagnosed as a secondary rather than a primary cause of the cracking. Here is why:

No mud wave was detectable in front of the fill. There was serious settlement in interior column caps in an unloaded area, which certainly were not affected by the fill, for here the ground might have risen. Major settlement was confined to the gully area, whereas the fill extended all the way along the rear wall to regions remote from the gully.

Pipe piles unsuccessful

An attempt at correction was made by sinking wooden caissons the depth of the fill and then jacking down pipe piles. This proved ineffective; the settlement continued.

In spite of adequate provision for expansion, a great deal of water came through the deck where cracks had occurred due to relative settlement and also where the deck was sufficiently porous to let the water through. As a result, serious, but not major, deterioration of the deck slab took place.

Obviously, proper correction required adequate foundations under the columns that had settled. Borings indicated that it would be necessary to go through strata that might give considerable resistance to piles to get to strata on which confidence could be placed.

After experimenting with several types of piles, it was decided to use steel H-piles driven to a resistance of 50 tons. They were placed along-

side the footings and capped with reinforced concrete, engaging the columns without disturbing the existing foundation.

The serious distortion of many of the concrete columns caused extremely high bending stresses, even without live load (Fig. 3). This condition could have been relieved by jacking the columns to the relative position they held originally, but the cost would have been prohibitive. Instead, these columns were strengthened by guniting 3-in. thick reinforced concrete jackets around them. Gunite also reinforced the cracked girders.

To protect the concrete where water was coming through and causing disintegration, a membrane was placed over large areas (Fig. 5). This membrane, which had been used successfully five years ago to protect the Marquette Stadium, consists of 3-ply roofing with a smooth, hard, roofing cap sheet for a wearing surface. The seats were removed temporarily to permit the membrane to be placed; then they were bolted back through it. Maintenance cost of the membrane has been low and that of the concrete is now negligible.

Stadium designed for permanence

In contrast to the Princeton and Philadelphia stands, the Rutgers Stadium was purposely designed to demonstrate that a reinforced concrete stadium could be built to stand up in a northern climate for decades without serious disintegration. Resting in a bowl excavation, the structure has a reinforced concrete frame constructed clear of the ground. It is divided (by expansion joints) into areas about 40 ft. square.

In line with experience on previous jobs, the design called for:

1. A dense concrete with unrubbed surfaces—controlled concrete, a designed mix and sound aggregate imported from a satisfactory source. The concrete surfaces were not rubbed because it was desired to preserve the skin that occurs next to the forms and is relatively impervious to water.

2. Elimination of construction joints in their usual form, in which reinforcement passes across the joint; in other words, no joints which would lead water to the reinforcement.

3. Keeping the reinforcing steel not less than 2½ or 3 in. from the surface.

The Rutgers Stadium has stood for about ten years now and its condition is reported to be most satisfactory.

Comparison of concrete with steel

Cornell University recently erected a west stand of steel opposite its crescent. Costs on this are of interest.

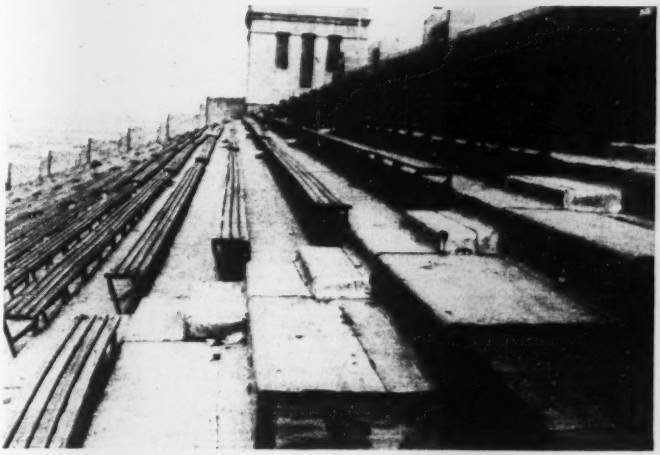


FIG. 5. MEMBRANE to protect stadium deck consisted of 3-ply roofing covered with a smooth, hard, roofing-cap-sheet wearing surface.

They ran about $24 per seat for the straight stand and $30 per seat including the press box and a certain amount of work in repairing the field. This compares with a projected reinforced concrete stadium at Rochester, N. Y., to be built in 1949, which is estimated to cost approximately $18 per seat.

The cost of painting a steel stand of this type might run 30¢ per seat per year. This would not be a high maintenance cost if compared with the maintenance of some of the older concrete stadia, such as the Cornell Crescent, Princeton Stadium and the Yale Bowl where extensive chipping and replacement have been necessary. However, this would look very high compared with the maintenance cost at Rutgers where modern design and construction methods have reduced maintenance costs in the first decade to practically nothing as far as the concrete is concerned.

Also, it would be high compared to reinforced concrete stadia of the older type after they had been waterproofed with a membrane and cap sheet.

Conclusions

Further precautions—For new construction, additional consideration should be given to these facts: If all reinforcing steel used in exterior work in cold climates were galvanized, it would pay big dividends in long life of the structures. Use of air-entraining cement would be added insurance against deterioration. Application of a 3-ply cap-sheet membrane would be still another precaution, but one that might be deferred until its need became apparent.

Repair of defective stadia—An important lesson here is that with a membrane to keep water out, a permanent repair job can be done on badly damaged concrete columns, treads and risers. This method of repair, that is, repairing damaged concrete structure, elimination of serious expansion stresses and addition of a membrane to keep the water out of the deck, is an excellent example of the one and only correct way to repair a reinforced concrete stadium that has been damaged by frost, water and expansion.

Repairs on the Princeton Stadium were made by the writer under the supervision of F. A. MacMillan, superintendent of the Department of Grounds and Buildings, and George R. Meyers, assistant superintendent, with the advice of Stephen F. Voorhees, who at that time was supervising architect. Concrete repair was by Robert W. Thompson Co.

The Philadelphia Municipal Stadium repairs were made by the writer under the direction and supervision of Thomas Buckley, director of the Department of Public Works, and Samuel S. Baxter, assistant chief engineer. Lewis & McDowell did the waterproofing and guniting and the Conduit & Foundation Corp. pile driving and underpinning.

The engineering of the Rutgers Stadium was done by the writer. The design was made by George Howell, architect for Rutgers Stadium, and the work was directly under the supervision of Albert S. Johnson, comptroller of the University.

Wet Vibration Puts Strength in Sand

Bedrich Fruhauf
Consulting Engineer, New York, N. Y.

EFFECTIVE COMPACTION of sandy foundations for rotary kilns and a 200-ft. chimney was essential in the expansion of a seaside industrial plant on the east coast. Kiln vibrations had caused uneven settlement of older foundations.

Internal vibration together with saturation with water, a process called vibroflotation (ENR July 20, 1939, p. 63) accomplished the desired compaction. Some 9,000 sq. ft. of foundation area was compacted to a minimum relative density of 70 percent.

The original plant was built in 1942, with footings placed on natural sand, which static load tests had shown to possess good bearing capacity.

Realizing that vibrations were causing the differential settlements, company engineers decided to try previbrating the soil where new kiln and chimney foundations would be built. (The 200 ft. chimney was designed as a slender reinforced concrete structure, which would be susceptible to vibration in high winds.)

To accomplish previbration, the company chose the vibroflotation process, which at that time was undergoing successful tests in granular materials in Nebraska (U. S. Bureau of Reclamation Report on Vibroflotation Experiments at Enders Dam, 1948.) From the USBR tests and from tests on this sandy seaside soil it was apparent that this soil was well within the range of materials that could be compacted by vibroflotation.

READY TO COMPACT. Vibroflot hangs in its leads, all set to plunge into soft foundation sand. Hoses carry electricity, cooling water for motor, and water for saturating sand. Motor and eccentric in Vibroflot head cause lateral movement of ¾ inch.

Vibroflotation equipment

The heart of the vibroflotation process is the Vibroflot, a 15-in. dia. vibrator unit 6 ft. 10 in. long, which is plunged into the material to be compacted, then withdrawn in stages as full compaction takes place. A 50-hp. induction motor, sealed inside the cylinder, delivers the power. A rotating eccentric, also inside, is a steel cylinder off-centered 1¼ inches. Maximum vibrating movement is three-fourths of an inch.

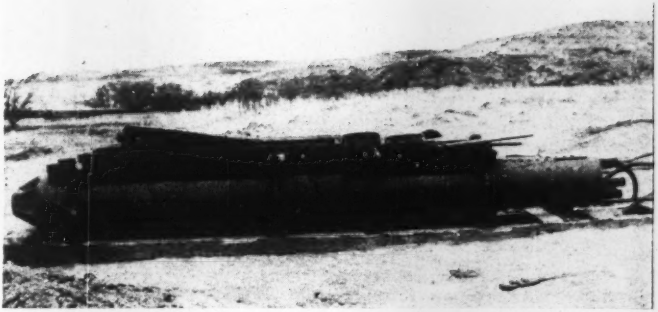
The Vibroflot is attached to 12-in. follow-up pipe sections by a transition section, and the follow-up pipes in turn are rigidly attached to a top section that has a cable-hook and a guide for preventing rotation of the machine during operation. The guide slides in piledriver hanging leads.

The whole assembly carries pipes for the following services: 1. Bottom-jet water (2-in. pipe), 2. top-jet water (2-in. pipe); cooling water for the electric motor (¾-in. pipe); and the motor cable (2-in. pipe).

On this factory job, the auxiliary equipment included a crane with hanging leads, a source of power (440-v. a.c.), sources of water under pressure (fresh water, 60-80 pounds; and salt water 100-120 pounds), and a recording ammeter (placed in the electrical circuit to measure the current to the motor).

The leads were suspended on the second crane hook and kept from twisting by struts to the crane body.

Based on the results of the Enders Dam tests, a rectangular or square pattern of insertions, with 7- or 8-ft.



SHIPPING PACKAGE. Vibroflot and transition section come on job assembled, in shipping frame. Length of package is 12 ft. (USBR Photo)

RECORDING AMMETER tells operator when full compaction is attained. Peaks and plateaus to right indicate maximum power consumption, when Vibroflot is working hardest.

sides was chosen, to insure a minimum relative density of 70 percent at any point of the compacted area. Compaction took place only within foundation areas. At the chimney, the 8-ft. spacing was accomplished in annular rings. For the full compacted area of 8,940 sq. ft., 149 insertions were specified, or one compaction for 60 sq. ft. of compacted area.

The compaction cycle at each insertion point was as follows: 1. Vibroflot set in a shallow hole and allowed to attain full speed; 2. bottom-jet (upward flow around vibrator) opened, providing a saturated mass of soil for the Vibroflot to penetrate; 3. Vibroflot allowed to sink by its own weight into the soil, which became temporarily "quick." (In the average insertion the Vibroflot descended 3 ft. per min.); 4. at prescribed depth, bottom-jet closed and top-jet opened, (water flowing downward); 5. sand in lower layer compacted; 6. Vibroflot retracted 2 or 3 ft. for next compaction; 7. operation repeated, in stages, to surface.

During sinking the Vibroflot precompacted the sand. The sand partly sloughed from the top of the hole, forming a crater 2 to 4 feet in diameter at the top. New sand was dumped into the crater to cover the Vibroflot during retraction. At each retraction layer, the vibration, aided by the downward water flow, consolidated the sand.

With increasing consolidation of the sand (and consequent harder work by the Vibroflot) the current put into the motor rose, until a maximum was reached, as registered on the ammeter record. Then the next retraction took place. Immediately the ammeter fell, since the vibrator was operating in a less dense material. The Vibroflot was left in the new position until the ammeter again rose to the maximum and then it was withdrawn to the next layer.

Water and sand were added as required. Sand added during the compaction was not specially chosen, but it was similar to the sand in the natural soil. In the average, 40 to 60 seconds were spent per foot of final compaction.

When the Vibroflot was withdrawn from the soil a volume 10 ft. in diameter, up to within 3 ft. of the surface, was found to be compacted to a high relative density.

Subsurface explorations

In order to determine in advance the necessary depth of compaction, and afterwards to check the results achieved by vibroflotation, an extensive soil exploration by means of borings and pits, with an exact analysis of the bore samples, was made under the supervision of the writer.

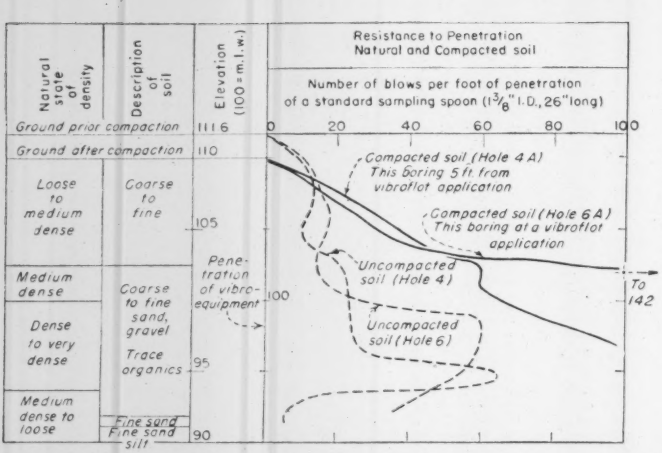
The sub-soil down to a depth of about 70 ft. is composed of strata of sand and gravel with a trace of silt or clay and interstratified with layers of varying thicknesses and consistencies of gray silty clay below the 40-ft. depth, and of one horizon of yellow silt.

With El. 100 corresponding to the mean low water elevation, the ground surface elevation varied between 108 and 112 feet. In general, the top of the first dense layer of soil, slightly cemented with gray silt, was found between El. 97 and 100. The dense layer was overlain by very-loose to medium-dense sand and fine gravel, which has been the foundation soil for practically all structures in the developed plant property. A quantity of decaying roots doubtless contributed to the overall porosity of this horizon. The natural state of density is indicated by the top line in the accompanying table. Relative densities of natural sand in test pits varied from

SAMPLE SOIL CHARACTERISTICS AT KILN FOUNDATIONS

Sample taken	Elev. (mlw.+100)	Soil description	Density Characteristics Voids Ratio	Porosity %	Relative Density %
Before compaction	106.2	C-M* sand, trace gravel	0.667	39.5	7.1
After compaction	106.3	C-F sand, tr. gravel, roots	0.436	30.0	82.4
" "	102.0	Gravel, C-F sand, tr. silt	0.193	16.2	100
" "	100.2	" " " little silt	0.263	20.8	85.0
" "	96.2	" some sand, "	0.247	19.8	87.0
" "	106.2	M-F sand, trace roots	0.527	40.4	77.8
" "	102.0	C-F "	0.367	26.9	79.5
" "	100.5	" " little gravel, silt	0.207	17.2	100.
" "	96.5	" " little silt	0.214	17.6	100.
" "	107.9	M-F sand, little roots	0.548	35.4	73.7
" "	107.2	C-M " " gravel	0.442	30.7	70.0
" "	100.0	Gravel, C-F sand, tr. silt	0.315	24.0	74.6
" "	97.5	" little sand, silt	0.274	21.5	83.0

*C-M-coarse to medium (F-fine)



COMPACTION CURVES (solid lines) indicate degree of compaction at various depths. Dotted lines show resistance of untreated sand. Insertions vary from 12 to 16 ft.

SUBSIDENCE STRATA. At far side of a footing excavation, sand bank shows strata that were flat, now curved with high points halfway between Vibroflot insertions.

7.1 to 57.6 percent at various points.

It was decided to compact the upper loose layer of sand and to prescribe accordingly the depth to be reached by the Vibroflot for each foundation; this depth varied between 12 and 16 feet.

Testing the results

After compaction, tests in shallow borings revealed that the relative density ranged from 70 to 100 percent (see table). The relative density indicating the degree of compaction is expressed by the following equation:

$$R_d = \frac{e_L - e_N}{e_L - e_D} 100\%$$

Where: e_L = voids ratio of soil in loosest state;
e_N = voids ratio in the natural state;
e_D = voids ratio in the densest state.

The effect of the vibro-compaction of soil can be observed from records of resistance to penetration of a standard sampling spoon. On the diagram plotted for two of the borings, dotted and solid curves on the right-hand side indicate the number of blows per foot of penetration required in soil before and after compaction. In most instances the increased resistance to penetration can be traced several feet below the lowest penetration depth of the device. With some reservations, it appears that in the local soil the resistance in excess of 20-25 blows per foot corresponds to relative density in the neighborhood of 70 percent.

The compacted soil and the natural dense layer together produced a layer of high density some 25 feet thick below the subgrade. This layer is capable of supporting 5,000 to 6,000 lb. per. sq. ft.

Other visible evidence of the mechanics of vibroflotation can be seen in the photograph showing deviation of natural stratification in a vertical sand bank. The highest point is halfway between two compaction centers. The sagging of originally horizontal layers measured as much as 12 in. over a distance of 4 ft. The banks of the compacted sand stood above the groundwater table on vertical slopes and the bottom of excavations was firm when properly excavated.

Special care was taken during soil compaction near existing structures—a 200-ft. high brick stack and a tunnel—to observe the influence of vibroflotation on adjacent foundation. It was found that, under correct arrangement of the compaction work, no settlements were produced in the adjacent structures founded above the level of Vibroflot penetration.

The actual compaction work, including 149 insertions, was completed in two weeks. After the crew got acquainted with the machine, up to 21 compactions were produced in an 8 hour shift. The work was done under the supervision of the Vibroflot patentee, Sergey Steuerman. The crew (provided by the company) consisted, in addition to the crane operator, of a foreman and 6 laborers.

The average amount of water used during the time of actual compaction was about 100 gpm. Since the sand was shoveled into the holes directly from the surface an exact check of the added sand amount was not feasible, except at the stack foundation, which was confined by a sheetpile ring. At that site a subsidence of $\frac{3}{4}$ of an inch per foot of compacted depth was measured.

The writer was retained by the company as a consultant, to supervise the exploration, depth of economical compaction and to verify the results accomplished by previbration.

READER COMMENT

Our May 5 Cover Picture

Sir: I sincerely appreciate the honor of being selected as one of your "cover engineers" (ENR May 5, 1949). However, statements to the effect that I direct all of the construction activities of the Pacific Gas and Electric Co., are misleading and unfair to several of my associates.

The company's engineering and construction work is performed under the general direction of W. G. B. Euler, our vice president and general manager. O. W. Peterson, engineer of general construction, has responsible charge of the construction of our hydro electric generation, transmission and substation projects, major gas and electric distribution lines and storage facilities, and the construction of our water storage and canal systems. Engineering of gas transmission, storage and distribution facilities is directed by R. S. Fuller, engineer of gas operation, under the general direction of D. D. Smalley, vice president in charge of operations, who also has general supervision of construction of electric and gas service extensions performed by personnel of the operating divisions.

The duties of the engineering department, of which I am in responsible charge, include initiation of studies relating to the planning, development and programming of additions and changes to the company's hydro and steam electric plant properties; the designing of all physical facilities except those employed in the transportation and distribution of gas; supervision upon assignment of the construction of some special projects; prescribing standards and preparing specifications for materials, equipment, and structures; inspection and testing of materials and equipment, and all problems associated with administering the company's water rights.

I. C. Steele,
Vice President and Chief Engineer,
Pacific Gas & Electric Co.,
San Francisco, Calif.

Inconsistency in Beam Design

Sir: Concerning Professor Boguslavsky's article, "Design of Concrete Beams Reinforced in Tension and Compression", which appeared in the May 5, 1949, issue, it seems that a slightly different application of the method might lead to divergent results.

Professor Boguslavsky assumes that the compressive steel is stressed to the maximum while the concrete is understressed. Theoretically, it would seem more economical to place the compressive steel a little further below the top so that both the steel and the concrete would be stressed to the maximum at the same time. For example, if the 0.975 sq.in. of steel is placed 4.7 in. from the top instead of the original 2 in., then the stresses would be 1,350 psi. in the concrete, 16,000 psi. in the compressive steel, and 20,000 psi. in the tensile steel, with the neutral axis 11.5 in. from the top. This would give the section a resisting moment in compression of

$$C_c\left(d - \frac{kd}{3}\right) + C_s(d - d')$$
$$= \frac{1{,}350 \times 11.5 \times 10}{2}\left(20 - \frac{11.5}{3}\right) + 0.975 \times 16{,}000\ (20 - 4.7)$$
$$= 1{,}490{,}000 \text{ in. lb.}$$

which is considerably higher than the original value of 1,100,000 in.lb. This conclusion is in contradiction with the well-known fact that shifting steel toward the neutral axis will weaken the beam. Evidently, something must be wrong somewhere.

The writer is not criticizing the incorrectness of Professor Boguslavsky's method, but rather is trying to call attention to such inconsistencies which will often result in the application of our present specifications and semi-empirical methods of design. Something is wrong with our conventional rules and procedures. It is impossible to give a consistently correct interpretation to some rule that is not consistent with facts.

T. Y. Lin
Assistant Professor of Civil Engineering
University of California
Berkeley, California

Concrete Design Dilemma

Sir: Concerning Prof. Boris W. Boguslavsky's article on design of concrete beams reinforced in tension and compression (ENR May 5), it would have been interesting if the author had shown that the value of $2n$ used in his computations was derived from tests of concrete beams for plastic flow. This could be done by computing the value of E_c for each pair of stress and strain readings taken at long intervals of time while the specimen is kept permanently loaded with its full working load.

Until a value of kn is determined in some such manner, or better including also the effect of fatigue, the requirement of specification 706(b) of the ACI code will remain arbitrary, regardless whether interpretations are new or old.

The fact that the type of beam in question is designed by proportion and checked by the transformed-section method, as demonstrated by the author, does not indicate that the allowance for plastic flow is correct. In the author's examples, identity of stresses in design and analysis results from the fact that the value of f_c = 1,000 psi. is figured at the outset to correspond to the values of f_c, f'_c, and $2n$, and the same moment assumed in design is used for analysis. Had the value of f_c = 1,350 psi. been used in design, the resisting moment as determined by the compression area would have been 1,479 in.-kips and as determined by the tension area, 1,100 in.-kips. Using the larger moment, the compression area is fully stressed, but the tension area is overstressed; conversely, if the smaller moment is used the tension area is fully stressed, but the compression area is understressed—the usual dilemma.

In the absence of experimental knowledge, the designer can best conform to specification 804(c), 1940 J. C. code by using the allowable stresses f_s = 20,000, f'_c = 16,000, and f_c = 1,350 for the grade of concrete assumed by the author. This will make kn = 14.82 and will require 34.3 percent more reinforcement, but the strength of the beam will be increased in the same proportion to meet possible future stress concentrations.

G. F. Ramirez
Senior Structural Designer
Burns & Roe, Inc.
New York, N. Y.

Plastic Flow in Beams

Sir: Prof. B. W. Boguslavsky's article on the design of concrete beams reinforced for both tension and compression focuses attention on a point that has been generally disregarded—the use of higher stresses in the reinforcement on the compression side of the beam than those used in analysis in most current textbooks.

This revision originated in the Joint Committee on Standard Specifications because of the fact that in the straight-line distribution of stresses, the compression reinforcement was always greatly "understressed", and it was desired to make use of such reinforcement to better advantage economically.

However, it was distinctly understood that it was only in the area of the compressive stresses that the change in modulus occurs due to plas-

tic flow, with the resulting transfer of stress from the concrete to the compressive reinforcement. In the tension flange or area of tensile stresses, on the other hand, the assumption is that the concrete does not "take" any tensile stress, so that the transfer of such stress to the steel is immediate and no "plastic" flow occurs in that area. For that reason it cannot be assumed that the modular ratio is the same in the tension flange as that in the compressive flange.

Moreover, in practical design only that amount of compressive reinforcement is used which will reduce the extreme "fiber" stress of the concrete to the allowable for the class of concrete specified.

As a matter of fact, it is evident that the straight-line theory of stress distribution cannot apply when plastic flow occurs. It is probable that the modular ratio varies greatly when elastic deformation ceases and inelastic deformations occur—which is the condition of so called "plastic flow".

It is unfortunate that such a condition precludes analysis by the method of the transformed section.

M. HIRSCHTHAL
Concrete Engineer
Delaware, Lackawanna and Western Railroad Co., Hoboken, N. J.

Combined Stresses in Columns

Sir: I wish to point out an error that I have often noticed made in reinforced concrete column calculations. When a column is subjected to a direct load together with a bending moment, an equivalent eccentricity is obtained by dividing the bending moment by the load. But instead of measuring the distance from the centroid of the effective area, as should be done, it is usually measured from the centerline of the column (assuming a rectangular section). If no tension is induced, the centroid of the effective area is on the centerline of the column. Where tension would be induced in the concrete, however, this concrete must be ignored, and the centroid of the effective area then moves away from the centerline of the column by an amount, which in my opinion, is too much to be overlooked in many cases.

Take the case of a rectangular bridge pier 36 in. thick, with 2.95 sq. in. of steel per ft. of width, 3 in. from each face, and carrying a load of 44.5 kips, together with a bending moment of 173 kip-ft. per foot of width. Under the above load, the distance to the neutral axis from the compression face is 12.4 in. The centroid of the effective area is 8 in. from the centerline of the column, and the maximum compressive concrete stress is found to be 1,050 psi.

The bending moment divided by the direct load gives a value of 46.7 in., so that the true equivalent eccentricity is 46.7 plus 8, or 54.7 in., from the centerline of the column.

If the value 46.7 in. had been taken as the eccentricity about the centerline, a maximum concrete stress of only 905 psi. would be obtained, a value considerably less than the true value of 1,050.

It should be noted that when the load is applied at a known distance from the column centerline, the problem is simplified, and moments may be taken about any point for the purpose of finding the internal stresses.

A. M. SCARLETT
Engineering Drawing Office
Ministry of Works
Auckland, New Zealand

Beam Design Without Formulas

Sir: In his article (ENR May 5, p. 16) Professor Boguslavsky describes his new interpretation of specification 706 (b) of the ACI Building Code "that will enable stresses to be obtained by transformed-section analysis that will agree with design stresses". As an example, he shows how to compute the areas of compression and tensile steel located 2 in. and 20 in. from the top of a rectangular beam 10 in. wide capable of resisting a bending moment of 1,100,000 in. lb., when f_c = 1,350 psi., f_s = 20,000 psi., f'_s = 16,000 psi., n = 10, with the following remarkable results: f_c = 1,000 psi., A_s = 3.241 sq. in., A'_s = 0.975 sq. in.

The following correct solution requires no explanation to those familiar with the three fundamental principles, which are the basis of all flexure theory:

$1{,}350 : 20{,}000/10 = k : (1 - k)$

$k = 0.403$; $20k = 8.06$;

$20 (1 - k) = 11.94$

Compression stress in concrete $= \frac{1}{2} \times 1{,}350 \times 10 = 54{,}400$ lb.

	1,100,000
$54{,}400 (20 - 8.06/3) =$	942,000
	158,000

Compression stress in steel $= \frac{158{,}000}{18} = 8{,}000$ lb.

Compression stress = tensile stress = 54,400 + 8,800 = 63,200 lb. The area of tensile steel = 63,200/20,000 = 3.16 sq. in.

The area of tensile steel remains constant, whatever hocus-pocus is played with the unit stress in compression steel.

If specification 706 (b) is not invoked, the unit stress in compression steel is 20,000/11.94 × 6.06 = 10,150 psi. and the required area 8,800/10,150 = 0.87 sq. in.

If specification 706 (b) is followed, the unit stress permitted is twice the above but not to exceed this unit tensile stress; here the area is 8,800/20,000 = 0.44 sq. in.

Professor Boguslavsky's transformed-section solution, which is supposed to reduce the area of compression steel by using specification 706 (b), actually requires more steel than when 706 (b) is not used.

If the advocates of the transformed-section method have a shorter solution than that shown herewith, the undersigned would be happy to be let in on the secret. Some advocates claim it has advantage over the use of memorized formulas, which are a "constant strain on the useful mental function, the memory".

So what? Well, why use formulas? More specifically, why expose the student to them? Text books are full of formulas. Why not give the student his choice, whether to memorize all of them or to know and understand the three well known fundamental principles in the theory of flexure. Give him the greatest surprise of his student days, by telling him that he has an intellectual faculty which if properly exercised, can imagine and reason as well as memorize. This will be a new idea to the average student, who has advanced from kindergarten to college almost entirely on his ability to memorize.

To quote Hardy Cross in one of his pithy statements: "So far as the student is concerned, I would rather he thought wrongly on his own feet than to sit in my lap and think correctly. In that way, I have some chance to make a man if the student discovers that God gave him his brain to work with". If the student uses his reason he should be able, with some arithmetic and modicum of algebra, to combine the principles of flexure and soon discover that formulas and transformed sections are excess baggage.

At first, stick to specific problems with numerical dimensions and quantities. Finally use b and d for dimensions and let the student derive the coefficients from which bd^2 and steel percentages are determined. Probably not one in five of the class will ever design a reinforced concrete beam after graduation; but the student will at least have the opportunity to develop mental power that may help him solve life's problems, the answers to which are not found in any text books.

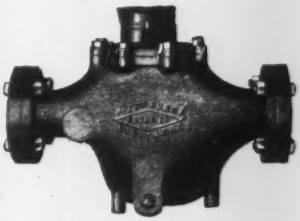
CHARLES A. ELLIS
Evanston, Illinois

PITTSBURGH-EMPIRE *large capacity meters*

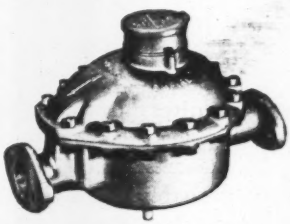
RIGHT for the job—RIGHT on the job

Commercial, industrial and apartment house services are potentially big revenue earners. To get all this revenue you need the right type of meter on every job. Fitting the proper meter to the setting is an important part of Pittsburgh-Empire service. We alone make all types of water meters, thus we can give you our recommendations without prejudice and in your best interests. To get all the facts on how to collect all your revenue, write the nearest District Office.

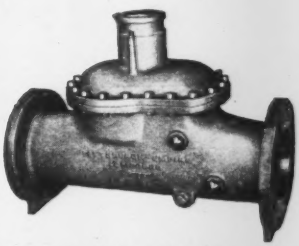
PITTSBURGH DISC METER
LARGE CAPACITY TYPE
An all-bronze case meter made in sizes from 1½-in. through 4-in.



PITTSBURGH EUREKA "B" METER
CURRENT TYPE
Sizes 2-in. through 6-in. Measures the velocity of rapidly flowing volumes of water.



EMPIRE OSCILLATING PISTON METER
TYPE 16
The only oscillating piston water meter made in sizes from 1½-in. up.



PITTSBURGH-EMPIRE COMPOUND METER
SINGLE REGISTER TYPE
(Two Register Arctic-Tropic Compounds also available)
Performs basic functions of both a displacement meter and a velocity meter. Sizes 2-in. through 6-in.

PITTSBURGH EQUITABLE METER DIVISION
ROCKWELL MANUFACTURING COMPANY
Pittsburgh 8, Pa.

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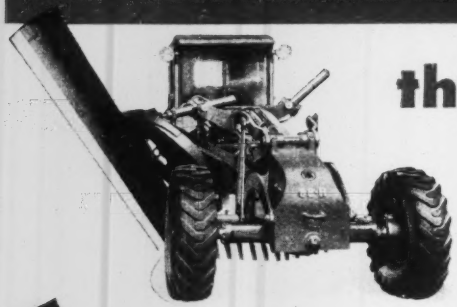
The Power Grader that has Everything

Now there are 3

DIFFERENT IN SIZE
ALIKE IN PERFORMANCE



the New "88-H"

Bringing to the field of medium-sized graders the extra power and traction of all-wheel drive, and the unequaled maneuverability of all-wheel steer.

"99-H" 12 years a "champ"

The "old reliable." Leader of the motor grader parade since the original "99" of 1938. Unexcelled for heavy duty, all-around performance.

the New MASTER "99"

If your work requires the utmost in power, traction and speed, your nearby A-W distributor will probably call it the best buy of the three for you.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

BUILDERS OF GREAT MACHINERY

Austin Western

SINCE 1859

Ant's-eye view of

Amcreco
Lowry Process
Creosoted Products

TIMBERS PILES PLANKING
FRAMED BRIDGE TIMBERS
POLES CROSS ARMS CONDUIT
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BRIDGE TIES

SOUND CONSTRUCTION

Made for LONG SERVICE LIFE with LESS MAINTENANCE

Strength and durability in the basic foundation builds soundness into your construction jobs. That's why Amcreco Creosoted Products are selected from the soundest timber — pressure treated by an advanced technique based on the Lowry Process—to assure enduring, long-lasting bridge work and freedom from maintenance troubles. As an added benefit, Amcreco Creosoted Piles, Framed Bridge Timbers and Planking economize in first cost, permit speedier erection. For economical "life insurance" on your next bridge job, specify Amcreco.

Pressure-treated for strength that lasts!

AMERICAN CREOSOTING COMPANY
INCORPORATED
COLONIAL CREOSOTING COMPANY INCORPORATED
GEORGIA CREOSOTING COMPANY INCORPORATED
LOUISVILLE, KENTUCKY

you name it—

The new Airco 700 Welds It ...from thin metal to 2" plate

Why? Because this new torch is available with a selection of tip assemblies that range all the way from Size 00 through the large No. 10 size.

This wide tip selection makes the Airco 700 suitable for your welding work — from thinnest sheet metal up to sections 2" in thickness. When equipped with a multiflame tip, this torch is tops for silver and aluminum brazing.

Each welding tip is assembled with an individual mixer drilled for that particular tip. In addition to wide operating range, other features of the "700" are: better flame control ... perfect balance ... and low maintenance cost.

With the addition of a cutting attachment, the Airco 700 can be easily converted to handle general shop cutting work.

If you would like more information about this torch, or a free demonstration right in your own shop, address Dept. EN-8468, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

AIRCO **AIR REDUCTION**
Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and other Gases...Carbide...Gas Welding and Cutting Machines, Apparatus and Supplies...Arc Welders, Electrodes and Accessories

UNIT PRICES BID BY CONTRACTORS

SWATARA CREEK BRIDGE. Unit prices on this Pennsylvania Turnpike bridge in Dauphin County, Pa. include twelve items, ranging from 1,610,000 lb. of plain steel bars down to 4 cu. yd. of riprap pavement. Sixteen contractors bid on May 31. John H. Wickersham Engr. and Constr. Co., Inc., Lancaster, Pa., was low at $422,712. He was awarded the contract June 1, subject to his qualification.

Unit Prices Available on 8-ft. Sewer Tunnel

ENGINEERING NEWS-RECORD will mail its readers copies of unit prices bid on 3.25 miles of 8-ft. concrete-lined sewer tunnel now under construction in the Peninsula section of Portland, Oregon. These prices have unusual value because they include units for three alternative methods of tunnel support: Steel sets, supplemented by timber; ½-in. liner plates and sills, with provision for extra thickness in liner plates; and full timber support. All but one bidder priced all three alternatives.

Four bids were received April 26th, ranging from $2,585,935 to $3,289,315. Time is a part of the consideration. Peter Kiewit Sons' Co. of Omaha bid $2,589,133 and 550 days; the low bidder stipulated 900 days so Kiewit got the job.

Terteling low bidder for Columbia Basin Work

A million dollars difference between the low and high of seven bidders on eight million dollars worth Columbia Basin work showed sharp figuring. J. A. Terteling and Sons Co. of Boise, Idaho was low at $8,029,762. The job: Earthwork, concrete lining and structures, 16 miles of East Low Canal; and the same type of work on 6.6 miles of Rocky Coulee Wasteway.

This work is located in the vicinity of Ephrata, Wash. East Low Canal in general has a 20-ft. bottom and paved sides 1 on 1¼, 21½ ft. high. Concrete is 4½ in. thick. The Rocky Coulee Wasteway bottom width is 12 ft. Structures include culverts, turnouts, highway bridges, a railroad bridge, siphons and a dike 20 ft. high and 1400 ft. long. Common excavation for the canal amounts to 1,831,000 cu. yd. for which prices ranged from $0.15 to $0.40. On rock excavation, 567,000 cu. yd., prices ranged from $0.38 to $1.35. Contract time on this U. S. Bureau of Reclamation project is 900 calendar days.

Nemaha River Levees Go to F. R. Orshek, Inc.

Almost two million yards of fill will go into agricultural levees to be built for the Corps of Engineers on Nemaha River, commencing about four miles south of Rulo, Neb., and continuing to the river's confluence with the Missouri River. Francis R. Orshek Inc., Fremont, Neb., was low among six contractors, at $674,115, on bids taken May 11. The high was $1,126,891, but three bids were below the government estimate of $791,355. Orshek has been awarded the contract, which is to run 550 calendar days. Principal features of work: Clearing and grubbing, borrow excavation, channel excavation, levee embankment, drainage structures and placement of stone protection. Work is on both sides of the stream. Labor rate range: $0.70 to $1.80. Eighteen items in schedule. Common excavation (201,000 cy.) went for $0.34; earth fill (1,756,000 cu. yd.) went fof $0.29.

Unit prices are available on four items including 120,770 square feet of sidewalk and 33,770 linear feet of curb in SASKATOON, SASK. Bids were taken June 1. Paul Kubica and Son, Saskatoon was low of three bidders. His sidewalk price was $0.32 per square foot.

Unit price reports on jobs cited in these columns will be mailed to readers of Engineering News-Record on request at no charge. Address: Manager, Business News Dept., Engineering News-Record, 330 W. 42nd St., New York 18, N. Y. Identify by quoting headline as used herewith, and be sure to give full mailing address.

"Tag-Master"

TAGLINE ADVANTAGES
You never had before!

1 Tagline pull is adjustable to suit job.
2 Tagline pull remains constant and uniform at truck level or 70 feet below machine.
3 Tagline pull is automatic.
4 The pull on the tagline can be increased INSTANTLY with manual control feature to manipulate a clamshell or grapple.
5 Accurate loading WITHOUT moving boom.
6 Accurate casting WITHOUT moving boom or machine.
7 Permits digging over a 25 foot range WITHOUT moving boom or machine.
8 Installed inside cab . . . no extra weight on boom.
9 Simple adjustment converts Tagline to a Dipper Trip for use with a Shovel Front.

The only Tagline of its kind
EQUALLY EFFICIENT AS A DIPPER TRIP

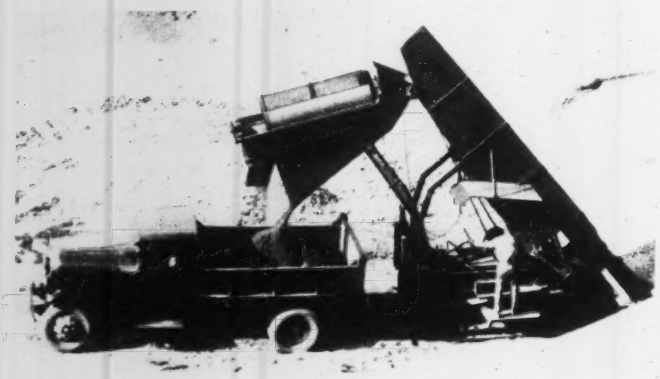
MORIN
MANUFACTURING CO., INC.
WEST SPRINGFIELD
MASS.

SEND COUPON NOW

Gentlemen: Kindly send details of the "Tag-Master". Here is the make, size and model number of the crane (or shovel) I operate:

Name .....
Company .....
Address .....

NEW PRODUCTS



Separates Sand and Gravel As It Digs and Loads

Featuring one-man operation, a new automatic rotary screen loader that separates sand and gravel as it digs and loads into trucks consists of a Nelson rotary screen mounted on a self-powered Nelson Model Q-10 heavy duty bucket loader. The rotary screen is constructed of steel plate channel framing and abrasion-resisting wire mesh screen. The screen is synchronized with the bucket conveyor of the loader. Two chutes at right angles direct the flow of separated materials. When digging and loading materials that do not require screening, a throw-out clutch enables the operator to disengage the screen and deflect material through the lower chute. The rotary screen handles damp and clinging sand. Screening capacity of dry mixtures ranges from 1 to 2 cu. yd. a minute, depending on the size of the screen openings and the mixture of the material. The Nelson Q-10 bucket loader, on which the rotary screen is mounted, has a steel-toothed feeder that picks before it shovels. Engineered to dislodge the material and spiral it into the buckets, this feeder eliminates extra manpower for shovelling and loosening the bank.—N. P. Nelson Iron Works, Clifton, N. J.

Water Conditioner

A low-cost water conditioner that lengthens the life of water systems and increases water softener capacity is "Bru-Cex," made from pure, food grade phosphate and packaged in crystal form. It is added to any water system by means of a simple feeder installed on the water inlet. Being slowly soluble, "Bru-Cex" requires merely the monthly addition of 25% of the initial charge. "Bru-Cex" is effective in stopping equipment losses due to scale, rust and corrosion. It controls red water and also increases the amount of soft water supplied. By stopping the formation of scale, "Bru-Cex" prevents clogged heater coils, tanks and pipelines.—Bruner Corp., 2318 North 30th St., Milwaukee 10, Wis.

Sprayable Wall Coating

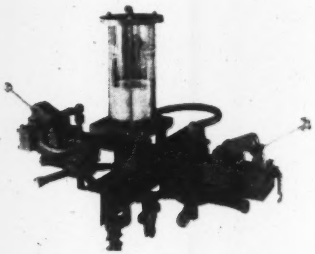
A sprayable coating for finishing monolithic, concrete, brick or block construction walls is called "Scotch-Top." It provides both color and texture in a single spraying operation. It can be used directly on inside or outside wall surfaces, and on ceilings. The coating resists scuffing, grease, oil, water, and weather. Coverage varies from 5 to 15 sq. ft. per lb. according to the job. Thicknesses can be from a thin film to a half inch or more.—Minnesota Mining and Manufacturing Co., 900 Fauquier St., St. Paul 6, Minn.

Electric Concrete Mixer

Non-tilt Eagle concrete mixer of 3½ cu. ft. capacity is powered by ½-hp. electric motor operating on 110-120 volts. Weighing 1000 lb., machine of trailer type, mounted on two rubber-tired wheels and equipped with chain drive, has the following overall dimensions: height, 60 in.; width, 60 in.; length, 60 in. Unit has dual mixing buckets and blade.—Sanataga Equipment Co., Inc., 481 Dyer Ave., Cranston 9, R. I.

White Prints from Any Copy

Model 93 Volumatic Whiteprinter for large-volume duplicating work in engineering and business office reproduces anything drawn, typewritten or printed upon translucent mediums at speeds up to 105 sq.ft. per minute. Produces positive prints directly from original drawing or document without intermediate steps.—Charles Bruning Co., 4754 W. Montrose Ave., Chicago 41, Ill.



Conveyor Lubricator

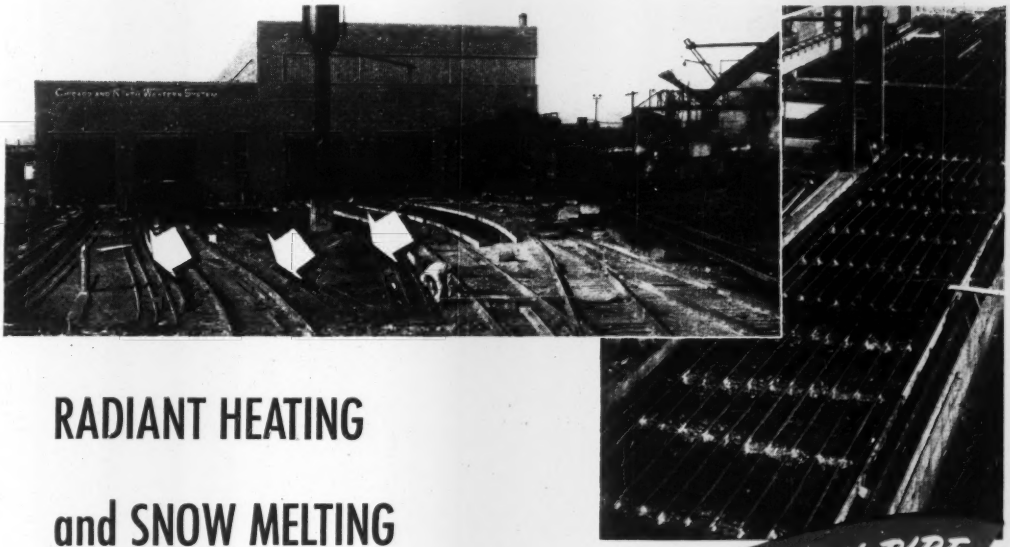
A simplified self-contained lubricator for conveyors is announced. It requires no external power and is driven by contact with the trolley wheels. As a trolley wheel approaches the lubricator the hub engages the sleeve of one of the five pumping units which is thus automatically brought into contact with the wheel bearing. Continued rotation of the lubricator forces the pumping unit inward, delivering a measured quantity of lubricant through the fitting to the wheel bearing. Thus one trolley wheel is greased and a cam located in the pump housing snaps the next pumping unit into the exact position to contact the next wheel as it comes along.—J. N. Fauver Co., Inc., 49 W. Hancock, Detroit 1, Mich.

Trench Jack

With this adjustable steel truck jack for lateral strutting of trench excavations, no cutting, wedging or nailing is required. It comes in three sizes covering a range of adjustment from 1½ to 5½ in. A safety feature is that the end plates are especially designed to insure positive and safe fixture in

(Continued on page 72)

In the CHICAGO and NORTH WESTERN Railway's New Diesel Shop



RADIANT HEATING and SNOW MELTING

with BYERS WROUGHT IRON PIPE

The necessity of constructing entirely new facilities for servicing diesel locomotives has one bright spot—it permits new ideas to be used to solve old problems. In building its new Chicago Diesel service and heavy repair shop, the Chicago and North Western Railway seized this opportunity to do something about the heating—always a difficult job in locomotive service structures, because of the large, frequently opened doors. Radiant heating was installed, using pipe grids fabricated from Byers Wrought Iron pipe. In addition, coils of Byers Wrought Iron pipe were laid under outside ramps and platforms to melt snow.

The ability of radiant heating to provide comfortable working conditions with rapid air change was originally demonstrated in airplane hangars, where conditions are even more severe, and in garages. Since warmth does not depend primarily on air temperatures, fluctuations due to infiltration do not cause employee discomfort. The possibilities for railroad use have already been extensively recognized, and installations in shops, stations and other buildings have already been made or are projected. Snow melting is also receiving wide recognition.

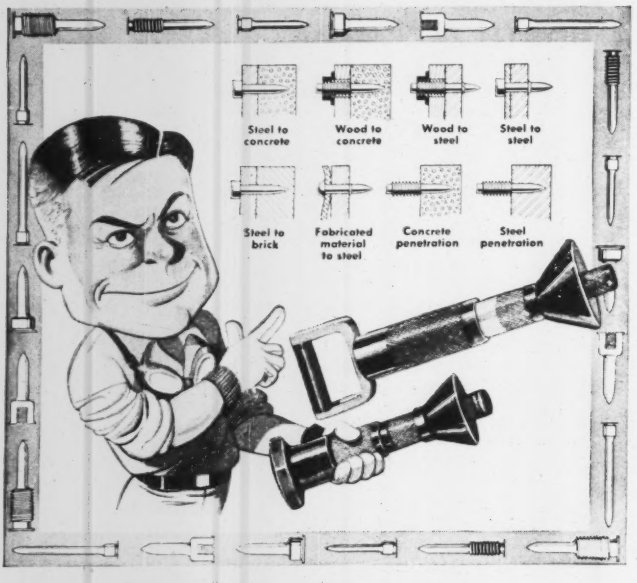
In an overwhelming majority of all the thousands of radiant heating and snow melting installations already made, Byers Wrought Iron pipe has been the chosen material. It is readily bent and welded, producing tight, enduring joints. It has a high rate of heat emission. It expands and contracts at practically identical rates with concrete, which eliminates stresses in floor slabs. And its superior corrosion resistance has been demonstrated conclusively.

Our bulletin, BYERS WROUGHT IRON FOR RADIANT HEATING, will give you the complete technical story of design, layout and installation. Ask for a copy.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, Seattle, San Francisco. Export Division: New York, N. Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS



JOE RAMSETTER...

the multi-job man!

Fastening jobs like those illustrated are all in a day's work for JOE RAMSETTER. With his light, self-powered RAMSET TOOL, and 63 sizes of pins and studs, he can set up to 50 fasteners per hour, to cut costs and finish the job faster.

No chipping, no drilling, no plugging. No electric or air lines. Prepare the RAMSET TOOL in 30 seconds. Then, place it against the work and RAM! The fastener is set instantly, tightly, easily. We teach any alert, careful workman to "RAMSET", in 30 minutes.

For fastenings in steel, concrete and other hard-to-work materials, RAMSET pays big dividends in time and money. Use the coupon for complete information.

Ramset FASTENING SYSTEM

Stemco Corporation
Cleveland 16 (Rocky River), Ohio.

In Canada—Globe Machine Tools, Batawa, Ontario.

Stemco Corporation,
Cleveland 16 (Rocky River), Ohio EN-6

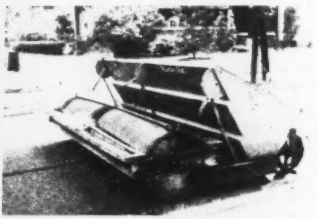
Please send details and arrange for demonstration of RAMSET FASTENING SYSTEM.

Name _____

Company _____

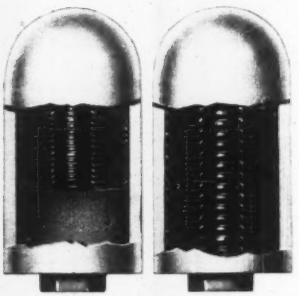
Address _____

trench wallings. It is designed primarily for supporting concrete form work. It can be erected very quickly and adjustment is positive and accurate. Other Acrow products include an adjustable steel scaffold stand; steel forms for concrete work; steel road forms; adjustable steel column clamps; and lightweight alloy scaffolding.—ACROW, INC., 420 LEXINGTON AVE., NEW YORK, N. Y.



Lightweight Spreader

A light weight spreader is well adapted to laying of plant mix bituminous paving materials on driveways, parking lots and streets. Made in two sizes—8 and 10-ft. spread, from one to four in. in depth. Spreader is towed behind dump truck which feeds materials into the spreader box. Preliminary compaction is obtained by adjustable rollers attached to the rear of the spreader. In transit the rollers are raised and the spreader is moved at truck speed on rubber wheels.—I. J. OVERMAN MFG. CO., 3301 SO. TORRANCE ST., MARION, IND.



Water Hammer Arrestor

The Wade Shokstop provides an air cushion to absorb water hammer pressure impulse, but positively prevents water logging of the air chamber. An ingeniously fabricated metal bellows allows free contraction and expansion of the air sealed within it but prevents all contact between air and water. Thus, the air chamber is continuously effective and provides constant protection against water ham-

(*Continued on page 74*)

WHY SHOP FOR A BOILER??

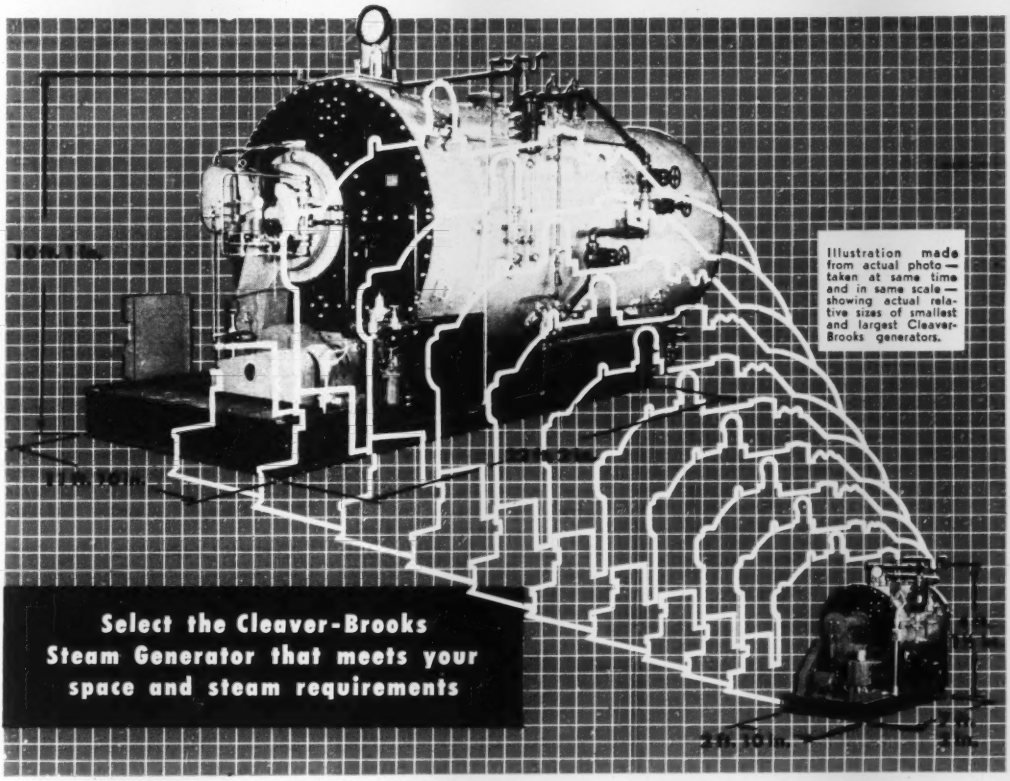


Illustration made from actual photo — taken at same time and in same scale — showing actual relative sizes of smallest and largest Cleaver-Brooks generators.
Select the Cleaver-Brooks Steam Generator that meets your space and steam requirements

WHY search and shop for a boiler — install a Cleaver-Brooks engineered and packaged steam generator that fully meets your steam requirements and needs only a minimum of space and headroom.

You can select from a range of sizes 15 to 500 hp. — and you can have your Cleaver-Brooks steam generator equipped for oil, gas, or with a combination burner which permits alternate use of gas or oil and provides for a quick change-over from one fuel to the other.

Equally important — you get Cleaver-Brooks guarantee of at least 80% efficiency from full load down to 30% of rating — with either gas or oil as fuel — and IN ALL SIZES.

Cleaver-Brooks steam generators enable you to burn the available fuel in your area — give you clean, smokeless operation—eliminate fuel and ash handling — need no high or costly stacks — no special foundations — fit under low headroom and into limited space — provide flexible operation to meet fluctuating loads — fully meet all codes.

Oil or Gas Fired . . . Guaranteed 80% Efficiency from Full Load Down to 30% of Rating . . . IN ALL SIZES

Available in a size to fit your needs — 15 to 200 p.s.i., 15 to 500 hp.—write for Cleaver-Brooks Steam Generator bulletin.

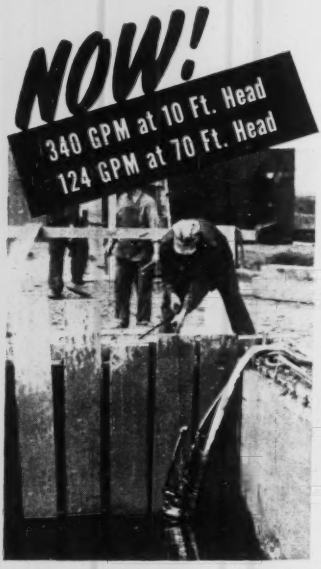
CLEAVER-BROOKS COMPANY, 389 E. Keefe Ave., Milwaukee 12, Wis.

WRITE on your business letterhead for Free Steam Cost Calculator — a ready reference slide rule showing the comparative steam costs when using oil, gas or coal as fuel.

Cleaver-Brooks

"Packaged" STEAM GENERATORS

HAVE SERVED INDUSTRY FOR MORE THAN FIFTEEN YEARS



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CLECO

NO. 183A AIR OPERATED

SUMP PUMP

All steel construction — weighs only 50 lbs. — requires no priming. Ideal for pumping water and other liquids from sumps, tanks, manholes, coffer dams, ditches, etc. Also in bronze construction for handling inflammable liquids.

Write for your copy of Bulletin 86

Manufacturers of:
GRINDERS
SANDERS
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RIVETERS
SAND RAMMERS
CHIPPERS
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IMPACT WRENCHES
SCREWDRIVERS
HOSE FITTINGS
SUMP PUMPS

CLECO DIVISION

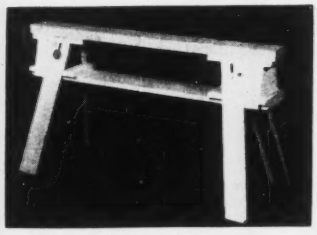
of the REED ROLLER BIT COMPANY

P. O. Box 2119 Houston 1, Texas

mer. Advantages include ease of installation and elimination of all maintenance or servicing needs. Pumps, piping—particularly underground lead service pipes, and water-using machines of all types—are constantly guarded against the excessive wear and strain caused by water hammer.—WADE MFG. CO., ELGIN, ILL.

Post-Straightening Device

A new device straightens bent metal posts used for parking meters, street and highway signs, fences, etc. The only tool required with the Postratner is a bolt wrench. It is one-man operated and weighs 60 lb.—BARBER POSTRATNER CO., 112 IRVINGTON ST. ANNEX, NEW HAVEN 13, CONN.



Folding Workhorse

Retractable legs fold in to tuck under the top rail of this ingenious folding workhorse (patent pending) to produce a practical, portable piece of equipment. When folded, the workhorse—measuring only 8 in. sq. by 3½ ft. long—is convenient to carry and can be stored upright in less than a sq.ft. of floor space, or kept in an auto trunk, closet shelf, etc. Non-mechanical operation based upon a special bolt permits instant setting up or folding away without any tools. Open, the workhouse stands 2 ft. high on a 3½ ft. length. Combination reinforcement bar and tool shelf produces maximum rigidity and strength. Precision made to support a 1,000 lb. load, the folding workhorse weighs only 15 lb. —FOLDING WORKHORSE CO., P. O. BOX 63, LONG BRANCH, N. J.

Manufacturers' Publications

Double-Acting Pile Hammers—(Bulletin) Covers ten sizes of McKiernan-Terry double-acting pile hammers and two sizes of pile extractors. Contains operating instructions, revised specifications, describes anvils and base attachments, pile-driving leads and rigs for pulling piles with inverted hammers.—MCKIERNAN-TERRY CORP., 15 PARK ROW, NEW YORK 7, N. Y.

Air Filtering—"A Comparative Study of Air Filtering Costs in Central Systems," is a 4-page folder containing data on the costs of air filtration, with comparative figures on installation and maintenance costs of cleanable units and replacement-type air filters. A form is included for use by the specification writer and others in calculating comparative costs for a specific installation. — OWENS-CORNING FIBERGLAS CORP., TOLEDO 1, OHIO.

Concrete Construction—Many forming and anchorage devices are described in a large catalog. Each major product classification is treated fully in a special section, including construction details and engineering data. On the back cover is a functional index. Thus it is easy to select products needed for any type of concrete construction. — RICHMOND SCREW ANCHOR CO., INC., 816-838 LIBERTY AVE., BROOKLYN 8, N. Y.

Power Wheelbarrow—Taking the high cost and hard work out of materials handling is the topic of a new catalog describing the "Moto-Bug," a new power wheelbarrow, sturdily built and powered by a standard 4-hp. gasoline engine. The barrow travels at from 2 to 4 mph., both forward and reverse, with a rated hopper capacity of 10 cu.ft. or 1200 lb.—KWIK-MIX CO., PORT WASHINGTON, WIS.

Packaged Pipe System—Bulletin tells of a novel idea—the "Speed-Lay" pipe system, a plan for simple, fast immediate installation of pipe line for general road and tunnel contractors, to be rented for temporary use or purchased for permanent use. It is a combination of pipe and Victaulic flexible couplings particularly suitable for compressed air, water and other services. It comes in a package all ready for use. —ALBERT PIPE SUPPLY CO., INC., BERRY AND NORTH 13TH ST., BROOKLYN 11, NEW YORK.

(*Continued on page 78*)

LOOK TO **P&H** FOR ADDED VALUES

"King of Swing"

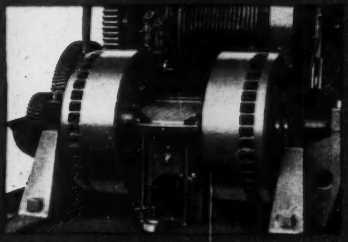
wherever big shovels work!

In the entire field of large excavators, there's nothing to compare with the "Magnetorque" swing on the P&H Model 1055.

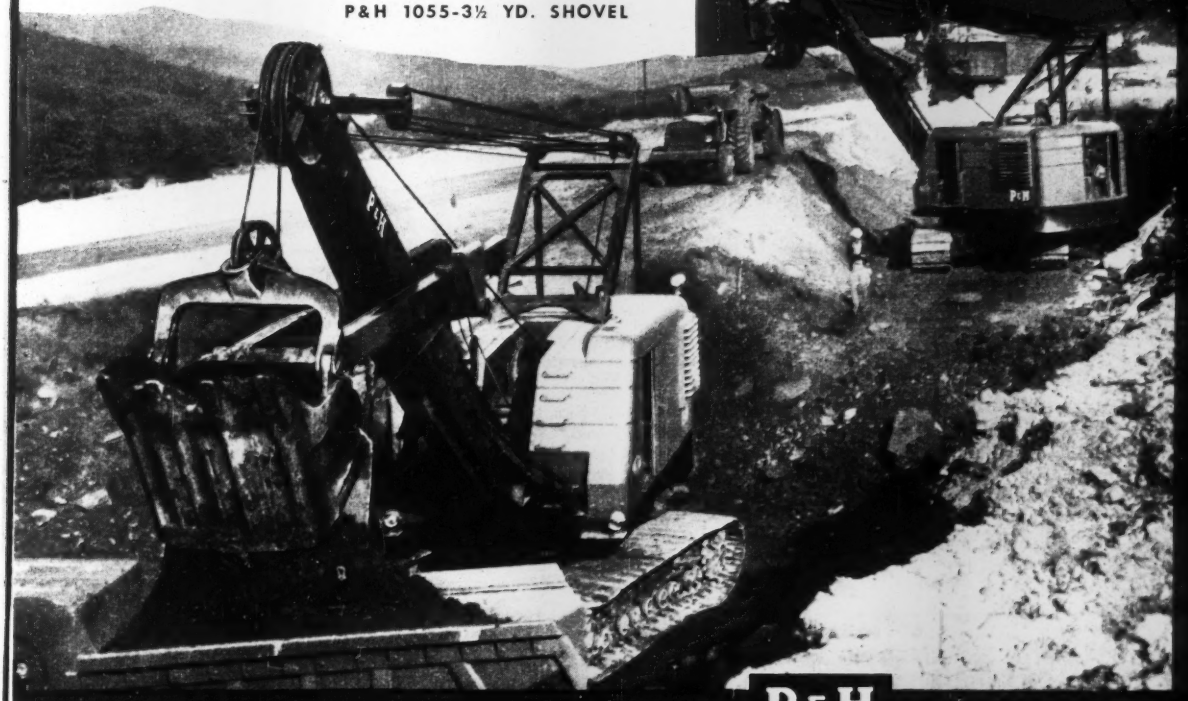
It's faster — up to 20% faster! That means more yards per shift — greater earning power. It's smoother — with "cushioned" starts and stops — easier on shafts, bearings and gears. It's more dependable — insures steadier operation — no time out for adjustments and replacement of linings. Best of all, it's simple — control system is free of complicated switch gear — easily understood.

All this adds up to trouble-free operation at absolute minimum cost.

Ask any owner of a P&H 1055. He'll tell you, "It's the slickest swing in the business!"



P&H 1055-3½ YD. SHOVEL

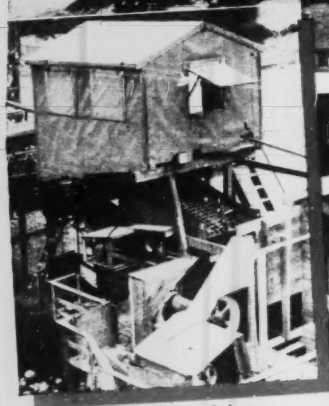


P&H

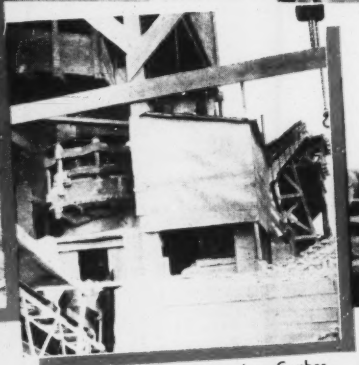
FLEXIBLE TELSMITH PLANT MAKES

200 TONS HOURLY

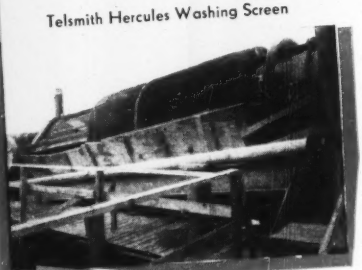
5 Sizes, WASHED GRAVEL
3 Sizes, CRUSHED GRAVEL
2 Sizes, SAND



Telsmith Two-Deck Pulsator
Telsmith Jaw Crushers



Telsmith Gyrasphere Secondary Crusher



Telsmith Hercules Washing Screen

● The MANCHESTER SAND, GRAVEL & CEMENT CO. plant at Manchester, New Hampshire, is turning out 200 tons of aggregate an hour—to supply federal, state, city and private jobs. Deliveries are made by trucks and railway cars.

This flexible Telsmith-equipped plant is making 5 sizes of washed gravel: 3½"-1½" (100% crushed), 1½"-1", 1"-¼", ¾"-¼", ⅜"-¼" —3 sizes of crushed gravel: ¾"-½", ½"-¼" minus ¼"—2 sizes of sand: minus ¼" concrete sand, and mason sand. It can also make bank-run sand and gravel with oversize crushed.

Mr. P. H. ("Pete") Rice, president of the company says, "*We have been completely satisfied with every piece of Telsmith equipment that we have had and the service has been excellent.*" Telsmith capacity, flexibility, product quality and economy will satisfy *you*. Get Bulletin G-2

TELSMITH Equipment in This Plant

- 24" x 5' Plate Feeder
- 4' x 8' 2-Deck Pulsator
- 10" x 30" Roller Bearing Jaw Crusher
- 10" x 36" Roller Bearing Jaw Crusher
- 4' x 10' 3-Deck Pulsator
- 36" Telsmith Gyrasphere Secondary Crusher
- 60" x 22' long Hercules Washing Screen
- 2' x 6' 1-Deck Pulsator
- Two—28" x 12' Single Screw Rewashers
- No. 6 Sand Tank
- 3' x 10' 3-Deck Pulsator

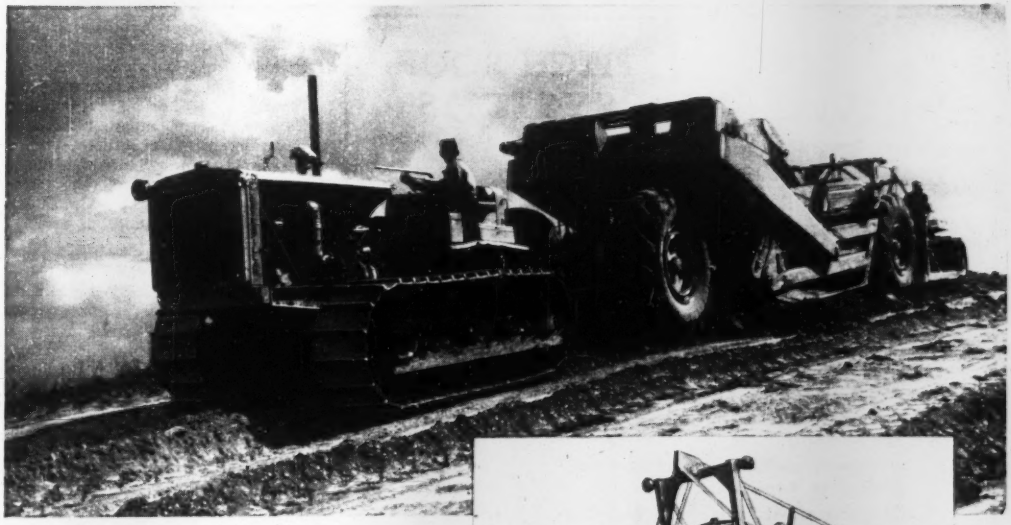
G-18

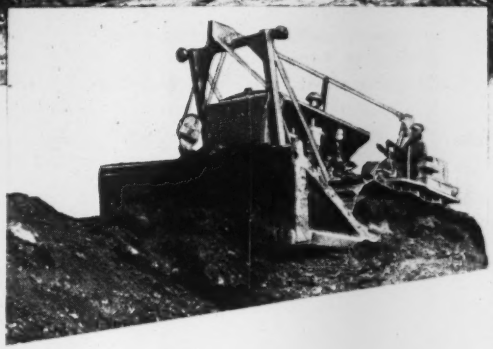
SMITH ENGINEERING WORKS, 500 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St., New York 17, N. Y. — 211 W. Wacker Drive, Chicago 6, Ill. — 713 Commercial Trust Bldg., Philadelphia 2, Pa. — 247 Third Street, Cambridge 42, Mass. — Boehck Eqpt. Co., Milwaukee 3, Wis. — Mines Eng. & Eqpt. Co., San Francisco 4, Calif.

Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • General Machinery Co., Spokane 1, Wash. • Brandeis Machinery & Supply Co., Louisville 8, Ky. • Rish Equipment Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.





Ralph Myers Contracting Corporation, Salem, Indiana, has the million-dollar contract for site development of the new Veterans Administration Neuropsychiatric Hospital at Pittsburgh, Pa. Over 1,500,000 yards of dirt, rock and shale are to be moved on a tough time schedule.

GULF QUALITY LUBRICANTS and FUELS

Smooth the way to greater yardage on big Hospital Project

RALPH MYERS Contracting Corporation is one of many leading contractors who have found that the use of Gulf quality petroleum products insures smooth, dependable equipment performance and low maintenance costs.

Gulf gasoline and Diesel fuel are clean burning, have exceptionally low carbon content, and provide more efficient power. Gulf lubricants provide an extra margin of protection—prevent excessive wear that leads to mechanical delays.

Gulf Lubricants and Fuels team up to help contractors do a speedier, more profitable job!

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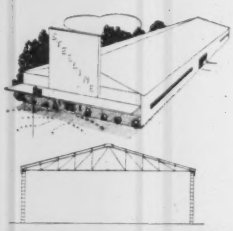
PITCH ROOF SYSTEMS

FOR MASONRY WALL CONSTRUCTION



- Spans up to 60 feet.
- 4 to 6 weeks delivery.
- Quality construction at low cost.
- You furnish foundation and walls—we furnish a packaged roof system which provides everything from eave line up.
- Standard pitch for trusses is 4/12. Standard design provides for 40#, 30# or 23# live load as required.

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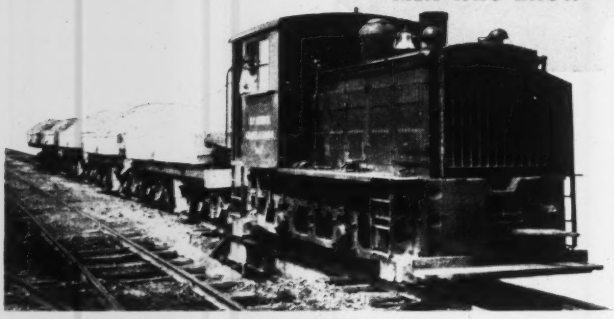

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Dependable In Performance; Performance Proved
Operative Under Many Conditions; Adaptable to YOUR Operations

FOR COMPLETE DETAILS WRITE TODAY

PLYMOUTH LOCOMOTIVE WORKS

DEPT. A-4 PLYMOUTH, OHIO

Tractor Shovel—A broadside, 22 x 32 in., illustrates a big new 76-hp. Payloader. Action views show some of its digging, loading, grading and carrying uses. The positive action of the four-wheel pneumatic tire traction under severe job conditions, such as sand, mud and rough terrain, is shown. One-and-one-half cubic yard bucket capacity.—THE FRANK G. HOUGH CO., 832 SUNNYSIDE AVE., LIBERTYVILLE, ILL.

Feeding Aggregates—A booklet discusses recommended practices for the systematic feeding of aggregates in crushing and screening operations. The text is in three parts: Feeding of Coarse Materials, Feeding of Graded Materials and Feeding of Mixed Materials. — PIONEER ENGINEERING WORKS, INC., 1515 CENTRAL AVE., MINNEAPOLIS, MINN.

Motor Grader Manual—A new service manual covering the operation, maintenance and major repair of the AD-3 and AD-4 motor graders has just been released. The 278-page book features 26 sections ranging from descriptions and specifications to fits and tolerances. — ALLIS-CHALMERS MFG. CO., TRACTOR DIVISION, SERVICE DEPT., BOX 512, MILWAUKEE 1, WIS.

Macadam Base Construction—A new 16-page booklet explains the action of the Seaman Pulvi-Mixer and shows how the difficulties of even distribution and leveling of crushed stone and other aggregates can be overcome.—SEAMAN MOTORS, INC., 305 N. 25th St., Milwaukee 3, Wis.

Industrial Waste Disposal—With this title, a bulletin describes the application of the automatic pH recording and controlling instruments and recording flowmeters to industrial waste disposal operations. Photographs of the instruments and diagrams of several typical waste disposal applications are included.—THE BRISTOL CO., WATERBURY 91, CONN.

Acoustical Materials — An 8-page booklet gives a full description of Acousti-Celotex cane fibre tile, mineral tile, steel facing tile, perforated panel board, perforated asbestos board, and lock board. The cane fibre tile is a rigid, lightweight product made from bagasse, the tough fibre of sugar cane. The fibers cling tightly together, producing an exceptionally strong tile. Interstices exposed by perforations give the tile its high sound-absorbing quality.—THE CELOTEX CORP., 120 So. LA SALLE ST., CHICAGO 3, ILL.

Elections and Activities

The Virginia Ready Mixed Concrete Association, Inc., was organized and incorporated recently to promote the welfare of ready mixed concrete producers and users in Virginia. President is J. C. McCarthy of The Lynchburg Ready Mixed Concrete Co. Frank Lucas of The Roanoke Ready Mix Concrete Corp. is vice-president, with T. C. Laramore, Jr., of Laramore Construction Co., Danville, secretary-treasurer. The executive secretary, John W. Mitchell, formerly with Frochling and Robertson, Inc., maintains the office and headquarters at 310 West Grace Street in Richmond. Directors: C. M. Birsch, J. F. Ingoldsby, C. W. Shank, L. R. O'Hara, T. C. Laramore, Jr. and H. P. Williams.

At the recent McLaughlin memorial student paper contest sponsored by the Dam Club of C. C. N. Y. graduate civil engineers prizes were awarded to members of the student chapter of the ASCE as follows: First prize, "Special Features of the Delaware Water Supply System," Peter DiLegge; second prize, "The Construction of the Governor's Island Ventilation Shaft of the Brooklyn-Battery Tunnel" by Abraham Solganick; and third prize, "General Features of the Delaware Water Supply System," George Carlson.

Gustav Egloff, director of research for the Universal Oil Products Co., Chicago, has been elected president of the Western Society of Engineers. Other officers elected were: H. P. Sedwick, vice-president of Public Service Co. of Northern Illinois, first vice-president; J. C. Witt, consulting engineer, second vice-president; and Donald N. Becker, chief structural engineer for A. J. Boynton and Co., treasurer. Ludwig Skog, senior partner of Sargent & Lundy, consulting engineers, and L. F. Bernhard, cost study engineer of Illinois Bell Telephone Co., trustees for three years.

The Kentucky Section, American Society of Civil Engineers held its annual joint meeting with student chapters of University of Kentucky and University of Louisville at Louisville on May 13. The following students participated in the competitive speaking: J. W. Pochomis—subject: "Determination of the Modulus of Elasticity of Concrete in Place"; G. H. Swearingen, Jr.: "Modernization of the Monon Rail-

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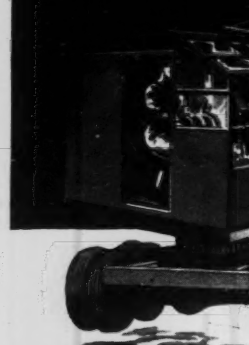

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In all power shovel applications, *capacity* and *utility* are essentials. A truck shovel must have high speed *mobility*, be immediately *convertible* and have *adequate capacity* to be economical on every job. A "QUICK-WAY" has all these fundamentals plus a long list of others.

"QUICK-WAYS" are designed for *full truck speed*, on or off the highway. Mounted on any standard truck, the working parts provide perfect operating *balance* for the truck shovel. All-steel construction gives built-in *strength* and *lightness* for maximum *capacity* and *stability*.

You get more utility out of a "QUICK-WAY" fully equipped, than any comparable equipment. Each "QUICK-WAY" is easily converted in minutes from SHOVEL to CRANE, DRAGLINE, CLAMSHELL, PILE DRIVER, SCOOP, TRENCH-HOE, BACKFILLER, etc. Buy only the attachments you want; your "QUICK-WAY" does more jobs better.

Parts are rugged and simple, requiring a minimum of servicing and having proved ability to take a life long beating. Many *interchangeable parts* and easy accessibility simplify maintenance and repair. From engine to attachment, every "QUICK-WAY" part will deliver its capacity rating and more.

The essentials built into every "QUICK-WAY" mean sure profits on a small investment; economical to buy, economical to use, it's one of the most useful machines you can own. There's a "QUICK-WAY" owner near you; ask HIM.

YOU CAN BUY A "QUICK-WAY" TRUCK CRANE for as low as $6,775.00 complete with chassis F.O.B. Factory Write for full details

MODEL E:
4/10 cu. yd. cap., mounts on any standard 5-ton truck.

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¼ cu. yd. cap., mounts on any standard 1½-ton truck.

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TRUCK SHOVEL COMPANY
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PIONEER IN POWER SHOVELS FOR TRUCK MOUNTING AND STILL THE LEADER

road"; H. J. Field, Jr.: "Improving the Durability of Concrete Made from River Gravel"; R. S. Edwards: "Why be a Registered Engineer"; W. G. Witt: "T-A-P Line"; W. L. Mullins: "Ohio River Valley Water Sanitation Compact." W. G. Witt was awarded first prize of $15.00; H. J. Field, Jr., second prize of $10.00; and J. W. Pochomis third prize of $5.00. Awards, each consisting of Society Junior Membership entrance fee and price of badge, were made to W. G. Witt from University of Kentucky, and to Wm. T. Runner from University of Louisville, who were designated outstanding civil engineering students by faculty committees of the two schools.

Appointment of three officials of the New York Good Roads Association, Inc., has been announced by Charles H. Sells, executive director. Thomas S. Brady, Albany, has been named director of membership and will have charge of a statewide membership campaign. Mr. Brady, who was associated with Mr. Sells in the building of roads and docks in Iran during the war, was employed by the Construction Sales Corporation of Albany prior to his appointment to his new post. He will maintain offices at the association headquarters, 116 Washington Avenue, Albany. Two field representatives have also been appointed. They are John H. Huber of Albany, and Paul R. Smith of Buffalo. A Sullivan County chapter of the association was organized at Monticello on June 6.

Erie County Chapter, New York State Society of Professional Engineers, has elected Elmer Hilburger, president; C. Arnold Dutton, first vice-president; William E. Dyer, second vice-president; Arthur Weaver, treasurer; F. Brendan Burke, recording secretary; Dale Bossert, corresponding secretary, and Kenneth Koontz and Franklin S. Helfter, directors.

MAJOR MEETINGS

American Society of Engineering Education, Rensselaer Polytechnic Institute, Troy, N. Y., June 20-24.

Symposium on Research in Water, Sewage and Industrial Wastes, sponsored by Public Health Service, Dept. of Commerce Auditorium, Washington, D. C., June 23-24.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 27-July 1.

American Society of Civil Engineers, Hotel Prado, Mexico City, July 13-15.

Pan American Engineering Congress, Rio de Janeiro, Brazil, July 15-24.

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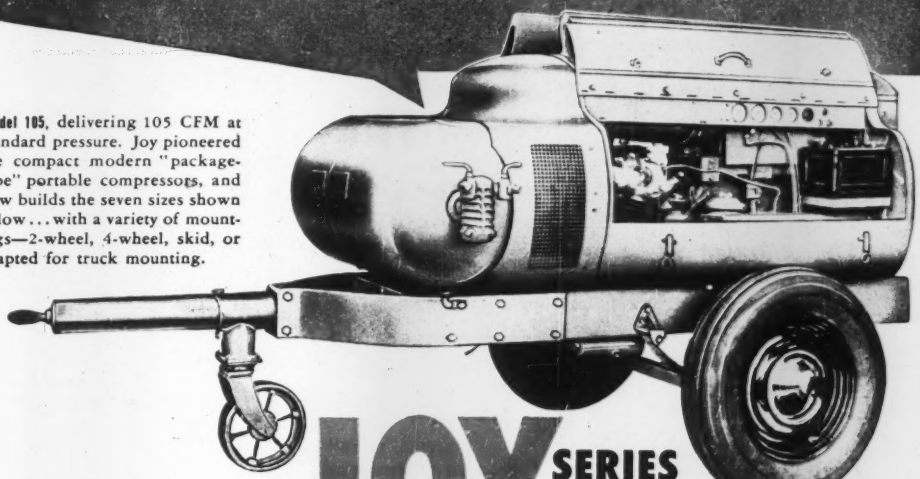
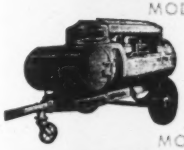


Model 105, delivering 105 CFM at standard pressure. Joy pioneered the compact modern "package-type" portable compressors, and now builds the seven sizes shown below... with a variety of mountings—2-wheel, 4-wheel, skid, or adapted for truck mounting.

JOY SERIES 80 PORTABLE COMPRESSORS

MODEL 60



MODEL 160

MODEL 210

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- ★ NOTHING TO MATCH THEM FOR MODERN, COMPACT DESIGN—PORTABILITY—RELIABLE AND EFFICIENT OPERATION

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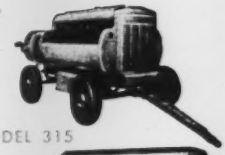

MODEL 315

MODEL 500

MODEL 630

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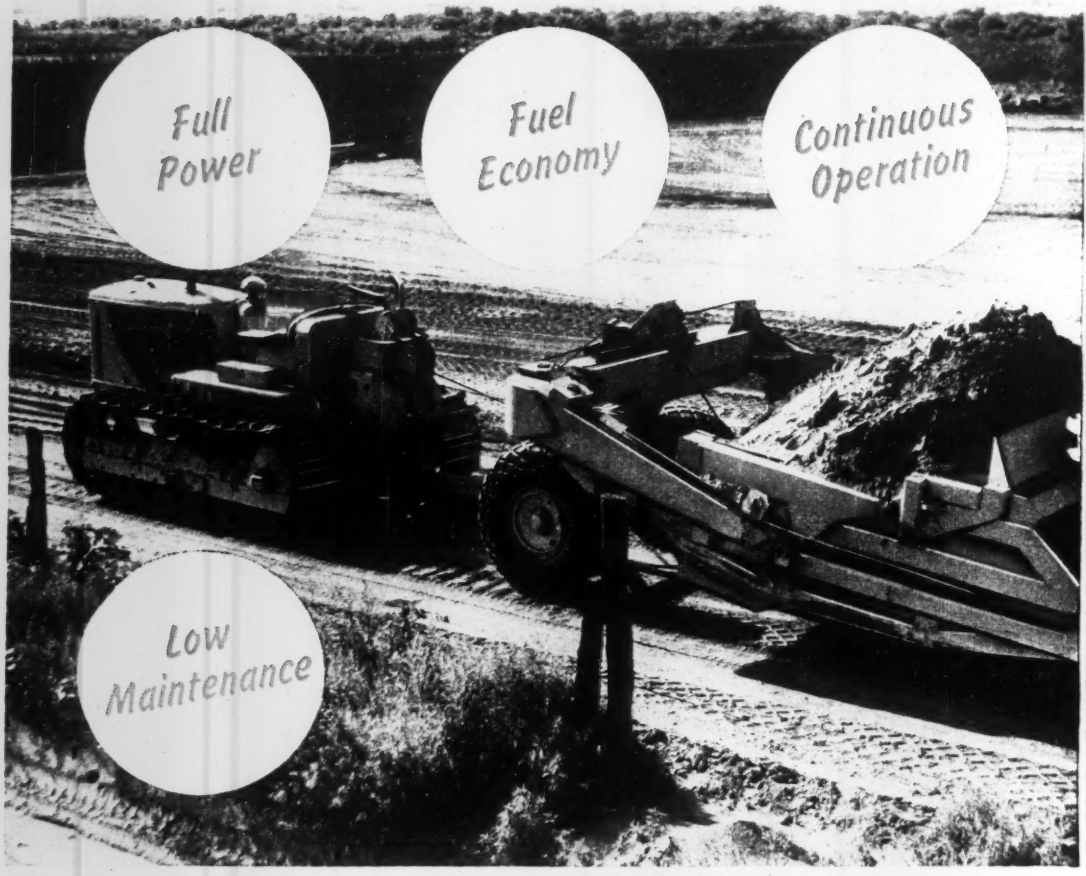
SINCLAIR TENOL of Maintaining



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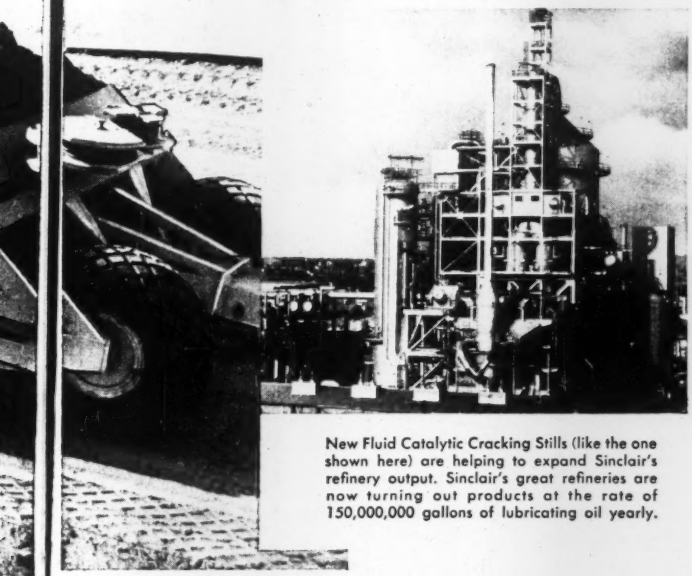
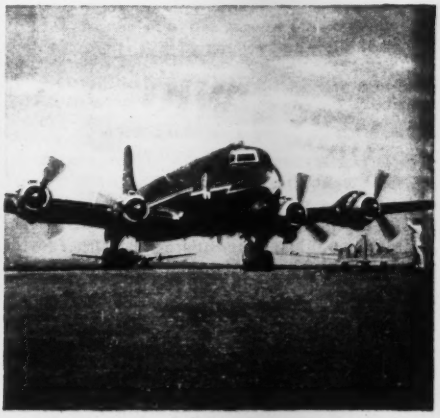
TENOL retards oxidation effects and reduces gum, varnish, and engine deposits to ward off valve sticking and thus promotes full power output. Combustion compounds, unburned fuel, carbon and soot, resins, dust and dirt remain suspended and are carried away in the oil draining. They do not accumulate as sludge to cause sticking and clogging.

TENOL helps maintain top production continuously . . . giving full power every hour in every day.



New Fluid Catalytic Cracking Stills (like the one shown here) are helping to expand Sinclair's refinery output. Sinclair's great refineries are now turning out products at the rate of 150,000,000 gallons of lubricating oil yearly.



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Do YOUR piping systems include valve-killing services that build up excessive maintenance and replacement costs? If so, the new Jenkins Fig. 976-A Plug Type Bronze Globe Valve will produce important savings for you.

Install it where "wire drawing", due to close control of steam, knocks out other valves quickly—where entrapped chips, rust, or scale score the seats and start leaks. See how it defeats the worst valve enemies . . . how it sets new records for endurance and economy.

HERE'S WHY

The stout "heart" of the Fig. 976-A is the stainless steel plug and seat ring, *hard enough* (500 Brinell) to smash steel pipe chips without scoring, yet *tough enough* to take a nine ton load without cracking. Other features are . . .

A **MORE THREADS, LESS WEAR**—Additional threads in bonnet and on spindle assure full thread engagement (open or closed), less load, less wear per thread.

B **NEW "TUFFARD" SPINDLE**—Aluminum bronze (tensile strength exceeds 65,000 lbs.)—tough to take stresses, yet hard for long wear. Bigger in diameter, with more strong threads.

C **NEW SLIP-ON, STAY-ON PLUG**—Simple design with T-slot for engaging spindle head is stronger, trouble-free, and permits free flow. Mirror-finished bevel assures perfect mating with seat ring.

D **NEW STURDY LUGS**—Flat-faced, V-shaped lugs on union bonnet ring and body ends, permit firm fit and grip of open end, pipe or monkey wrench—withstand repeated disassembly.

500 BRINELL ARMOR SEAT Plug and Seat Ring of Jenkins JX-500 special alloy stainless steel—heat treated to 500 Brinell hardness and extraordinary ductility—lapped together to a mirror finish. Unaffected by throttled steam, resists galling, erosion, corrosion.

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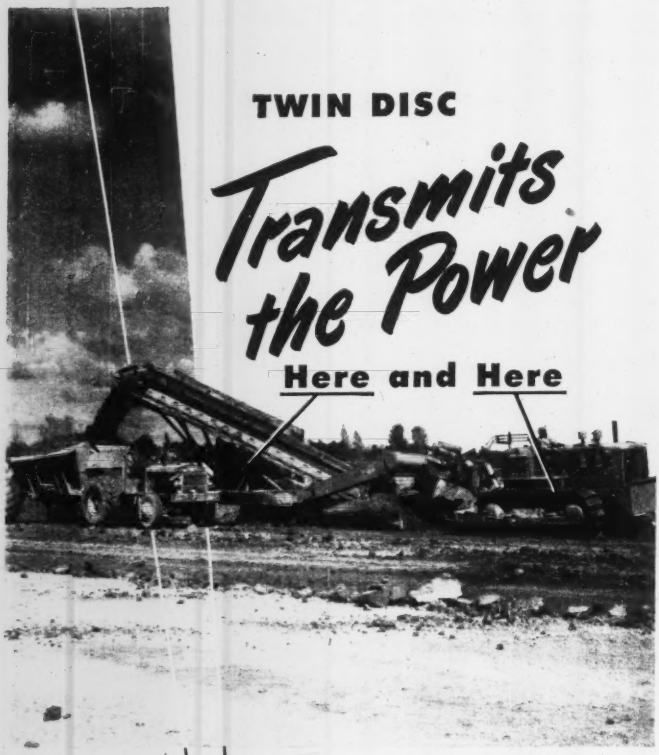


● Here—as in most types of construction and material handling equipment—Twin Disc transmits the power. For the Allis-Chalmers HD-19 Tractor transmits its power through a Twin Disc Hydraulic Torque Converter . . . and the Euclid Loader drives its dirt conveying system through a Twin Disc Clutch Power Take-off.

The Twin Disc Hydraulic Torque Converter (Lysholm-Smith type) assures more work from the tractor because it automatically holds the horsepower output of the HD-19's engine near maximum. Longer life of the tractor results from elimination of shocks and gear shifting; and this smooth operation makes the job easier for the operator.

The Euclid Loader, which is equipped with a Twin Disc Power Take-off, has established new earth moving records on many different types of jobs—big yardage and small. And every Twin Disc Power Take-off unit is built to perform as an integral part of the machine in which it is installed—large or small.

Write the Hydraulic Division for Bulletin 135-C on Torque Converters or the Twin Disc Racine Office for Bulletin 129-C on Power Take-offs. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Men and Jobs

Charles C. Agar of Elsmere, N. Y., recently was appointed chief of the water pollution control section of the New York State Department of Health. A 1920 graduate of Worcester Polytechnic Institute, in 1925 he entered the sanitary engineering profession as a research chemist at the Worcester, Mass., city sewage treatment works. In 1937 Colonel Agar was elected president of the N. Y. State Sewage Works Association and won the Kenneth Allen memorial award for the outstanding contribution to the profession that year. He was the sanitary engineer of the Third Army, being on General Patton's headquarters staff.

Seth W. Booth, associate chief of the engineering department of the Naval Ordnance Laboratory at White Oak, Md., has been named chief to succeed **Royal Weller,** now chief scientist for the Naval Air Missile Test Center, Point Mugu, Calif. Mr. Booth, a graduate of Rensselaer Polytechnic Institute, joined the laboratory in September, 1941, after 12 years with the New York Telephone Co., and received the Navy's Distinguished Civilian Service Medal for important contributions to development of the laboratory during the war.

Wayne G. Bryan has resigned as city engineer of Neenah, Wis., to become director of public works, Portage, Wis.

L. W. Funk, Charleston, S. C., has been named assistant chief engineer of the Atlantic Coast Line R. R. A graduate of Alabama Polytechnic Institute, Funk joined ACL in 1919 as a rodman.

E. H. Bruntlett has joined Ealy G. Briggs, consulting engineer in municipal work, at St. Paul, Minn.

Do you know that AVA CABLES can deliver up to 49% extra current per raceway?*

Yes, wherever sizable electrical loads are carried in dry locations,† you may find substantial installation savings in General Electric Deltabeston® AVA cables.

Used for years in industrial spots where operating heats are high, Deltabeston cables carry high current ratings. Used at normal temperatures, they can safely carry far greater loads for their size than ordinary Type R building cables. Because they are insulated with heat-beating asbestos, they can actually deliver up to 49% more current per raceway.

To you, Deltabeston AVA cables mean *installation speed*, because they can help on many jobs by cutting the number of cables you put in—*material savings*, because AVA cables can deliver extra current per raceway—*weight savings*, because small size means light weight.

It will pay you to begin planning with your electrical contractor for Deltabeston AVA cables. For information, write to Section Y32-632 Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

† *As defined by the National Electrical Code.*

* The figure above was worked out for AVA cables at 1000 MCM. Larger and smaller sizes give similar savings.

GENERAL ELECTRIC

SUPPORTED BY CREOSOTED FOUNDATION PILES

carrying 30 to 35 tons each!

Passenger Station of the Cincinnati Union Terminal, Cincinnati, Ohio.

CINCINNATI's Union Terminal was completed in 1933 at a cost of $41,000,000. This tremendous railroad terminal was constructed on a filled site; therefore, it was necessary to found almost all of the structures on piling. Nearly 10,000 creosoted pine piles, ranging from 45′ to 65′ in length, were used. Today, each of the creosoted foundation piles is *still* carrying 30 to 35 tons . . . *without settlement in the heavy fill.*

During the construction of this project, because the heads of all timber piles were so far above ground-water level, engineers of the Terminal Company made an exhaustive study of the permanence of creosoted wood piles. Their conclusion: pressure-creosoted wood, when embedded in earth, regardless of the moisture in the soil, *may be considered as permanent construction.*

Also, competent authorities have estimated that the use of creosoted timber piles undoubtedly accounted for a saving of close to $500,000 over any other type of permanent piles which could have been used in this construction.

Many Koppers Pressure-Creosoted Foundation Piles were used in this project. Naturally, Koppers is proud to have had a part in once again proving that creosoted pile foundations are both permanent and economical.

KOPPERS COMPANY, INC, Pittsburgh 19, Pa.

KOPPERS PRESSURE-TREATED WOOD

Lieut. Col. Lawrence J. Lincoln, since 1948 deputy engineer at Fort Shafter, Hawaii, has been appointed District Chief of Army Engineers at Denver, Colo. He succeeds **Lieut. Col. Craig Smyser,** who has been transferred to Washington as executive officer to Maj. Gen. Lewis A. Pick, Chief of Army Engineers.

Changes in the Corps of Engineers Missouri River division office are: **Lieut. Col. Edward R. Brown, Jr.,** who has been teaching at the Fort Belvoir Engineer School, has been appointed executive officer. He succeeds **Col. James Truitt,** who has been transferred to Portland, Ore., for duty with the Alaska district. Wendell E. Johnson, chief of the engineering division of the Omaha district office, has been named to head the similar department in the Missouri division office. Mr. Johnston succeeds **F. B. Slichter,** who has been transferred to the office of the Chief of Engineers in Washington, D. C.

Johnson & Johnson, engineers, 11 West Washington Street, Chicago 2, Ill., announces the opening of an office at 1006 Berry St., Houston, Tex., to be known as: Johnson & Johnson, Richard T. McKay Associate Engineers. This organization has designed plants and structures for E. I. duPont de Nemours & Co., Inc., National Dairy Products Corp., Marquette Cement Mfg., U. S. Gypsum Co.

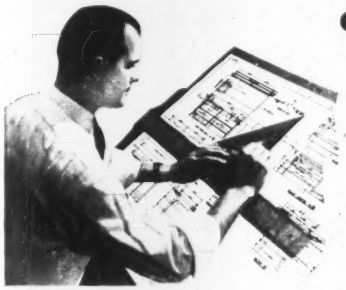
James D. Macintosh, Jr., civil engineer graduate of Clemson College, is city manager of Lancaster, S. C.

F. Stuart Chapin, Jr., director of city planning at Greensboro, N. C., since August, 1947, has resigned to become an associate professor in the department of city and regional planning at the University of North Carolina, Chapel Hill.

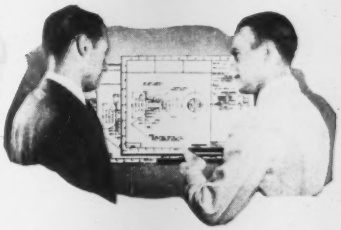
Appointment of **A. J. Morrison** as manager of the shaft and tunnel department of Dravo Corp.'s contracting division, Pittsburgh, has been announced. Mr. Morrison, who was graduated a civil engineer at the University of Cincinnati, 1917, started with Dravo immediately. He served with the Army Engineers during the first World War and returned to Dravo in 1920.

Frank J. Buckley, former chief engineer of construction for Andrews & Clark, consulting engineers, 305 E. 63d St., New York 21, N. Y. has become a partner in the firm with W. Earle Andrews and Ernest J. Clark.

Here's the new low-cost photographic intermediate engineers have been waiting for



Here's increased protection. Kodagraph Autopositive Paper preserves the detail of your new drawings . . . restores your old, soiled, faded ones. Gives you, in every case, intermediates of original quality – or better . . . with dense black photographic lines on a clear, non-curling, translucent base. *Intermediates* that are durable in print making . . . and photolasting in your files.



Here's increased shop-print quality. You'll see the difference in blueprints and direct process prints made from Kodagraph Autopositive intermediates. Every detail is sharp, clear . . . easy to read and follow on the production line – helping to assure fewer errors in the shop . . . fewer time-outs to decipher faint, blurred prints.

Kodagraph Autopositive Paper

Here's increased operating efficiency. Using Kodagraph Autopositive intermediates, you can turn out prints at uniform, practical speeds in your direct process or blueprint machine . . . maintain a continuous production run. You'll find, too, that "Autopositives" are flat-lying . . . easier to handle. And longer-lasting, as well . . . because they have a tough, durable paper base . . . and lines that retain their ink-like density through repeated printings in your machine.

EASTMAN KODAK COMPANY
Industrial Photographic Division
Rochester 4, N. Y.

"Kodak" is a trade-mark

All of these advantages at a new low cost . . . because Kodagraph Autopositive Paper is inexpensive to buy . . . and easy for you or your local blueprinter to process. It produces positives directly – without the wasteful negative step. Furthermore, it can be handled under normal lighting . . . exposed in any direct process or blueprint machine or vacuum frame . . . and developed in standard photographic solutions.

To learn more about this revolutionary new photographic intermediate, write for a free copy of "The Big New Plus."

FREE Kodagraph booklet

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EASTMAN KODAK COMPANY
Industrial Photographic Division
Rochester 4, N. Y.

Please send me a copy of "The Big New Plus"– your booklet about Kodagraph Autopositive Paper, and the other papers in this new Kodagraph line. I have
☐ direct process ☐ blueprint ☐ contact printing equipment.

Name _____ (Please Print)
Department _____
Company _____
Street _____
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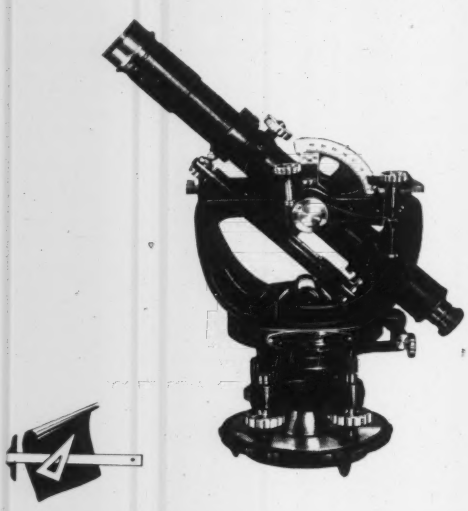
Kodak

Avoid COSTLY ERRORS

Save Time and Money



You'll find

THE DAVID WHITE UNIVERSAL LEVEL-TRANSIT

IS THE MOST PRACTICAL ALL-AROUND CONTRACTOR'S INSTRUMENT YOU'VE EVER HANDLED

YES, you'll be time and money ahead if you use a David White Universal Level Transit in connection with all your survey and checking operations — your building and road construction. It is a low-cost, extremely accurate, amazingly rugged instrument. It quickly converts from level to transit. It's designed to provide maximum strength and protection to all parts — assuring you constant precision over long periods of use.

Among its many features are: Full 12" telescope with 25 power coated optics, a patented ball-bearing race, lock and release lever system, easy perfect alignment adjustments, guarded horizontal circle, vernier accurate to 5' vertical arc 3" diameter. Write today for complete information, price, etc., and the name of our nearest dealer.

We offer complete, prompt, repair service on all makes of instruments — levels, transits, theodolites, etc.

DAVID WHITE COMPANY

Manufacturers of
INSTRUMENTS FOR ENGINEERS, SURVEYORS AND BUILDERS
315 West Court St. • Milwaukee 12, Wis.

OBITUARY

Roy A. MacGregor, 65, executive secretary of the Constructors Association of Western Pennsylvania, died June 7, at his Crafton, Pa., home.

Carl R. Eppler, civil engineer, associated with the engineering department of Syracuse, N. Y., for more than 25 years, died June 3.

George Hart Morse, 78, inventor and retired Federal Power Commission engineer, died June 1 in Arlington, Va. As an FPC engineer, he was chief of the distribution cost survey. He also had served as chief engineer of the Power Authority of the State of New York, and was power specialist with the Emergency Fleet Corporation during World War I. He was graduated from the University of Minnesota in 1893 and received an advanced degree in engineering in 1911.

Charles Skelton Thompson, 70, Gastonia, N. C., paving contractor, died June 3. He was vice-president and treasurer of the Noll Construction Co. of Chattanooga until the firm, which paved many roads and streets in the Carolinas, was dissolved several years ago. Latterly he was connected with the Brown Construction Co. of Lexington, N. C.

Edward W. Botten, 51, secretary-treasurer of the Owens Bucket Co., Cleveland, Ohio, died June 4. He was a graduate of Case Institute of Technology, 1919. In the first world war he was in the Navy and in the last war he was on the War Production Board.

James A. Crelley, 71, former assistant superintendent of public works of Batavia, N. Y., died June 3. He had been a resident of Batavia for 50 years.

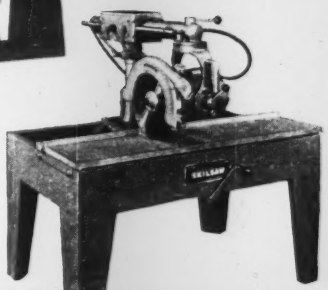
Henry W. Rath, operator of New York City's Tallman's Island sewage treatment plant, died June 9.

Charles A. Scott, formerly a city engineering official in Kansas City, Mo., and more recently a construction engineer for the Gillioz Construction Co. of that city, died June 2.

Alexander Gray, 68, former port manager at St. John, N. B., died June 6. He had retired two years ago after long work in the field of engineering and harbor administration.

Reuben L. Ewell, 74, Ravenna,

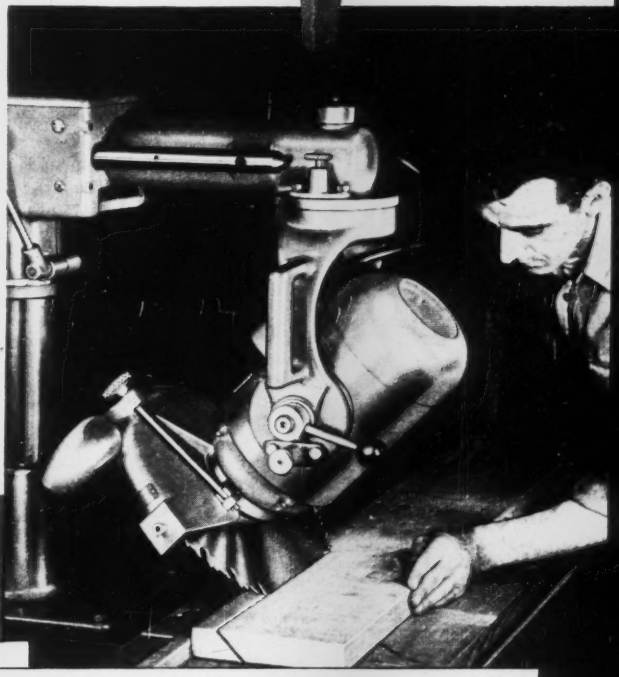
Here's why Radial SKIL Saw is your best bet for fast...precise ...high-production sawing!



Exclusive *RETRACTABLE ARM!*
DOZENS OF SUPERIOR FEATURES!

Radial SKIL Saw is tops . . . for speed . . . for precision . . . for ease of operation. Finger-Tip control . . . quick, simple adjustments (all made from the front) . . . constant accuracy and precision! They're all yours with this better tool!

Look at its features! Everything about Radial SKIL Saw adds up to peak production . . . finest performance . . . lowest maintenance costs and long service. Ask your SKIL Tool Distributor to demonstrate Radial SKIL Saw today!



ALL THESE SUPERIOR DETAILS SAVE STEPS...SAVE TIME... SAVE MONEY FOR YOU!

FAMOUS RETRACTABLE ARM

- **Slides freely** on double-row ball bearings!
- **Stays accurate** for precision cutting. Extra bearings at top front and lower rear, easily adjustable for true alignment!
- **More room for job set-ups** because sawing head moves out of the way!
- **Clear-view sawing** with layout marks always in sight!

DOZENS OF SPECIAL FEATURES

- One-piece saw guard . . . easy to remove without tools.
- Plunger pin locks for rapid adjustment of sawing head.
- Felt wipers keep arm rails always clean.
- Flexibility to make all compound cuts.
- Ripping scale mounted on arm for accurate measurement.
- Tapered wedge lock for fast, precise location of straight and both right and left 45° cut-offs.
- Enclosed dustproof motor.
- Unique design.
- Finest engineering.
- Top quality workmanship and materials.

FRONT ADJUSTMENT OF ALL CONTROLS

- Retractable elevator handle in front.
- Quick adjustments for all cuts without leaving operating position.

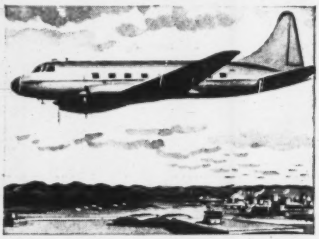
SKIL Tools

SKILSAW, INC.

How SPEED helped catch "bugs" in the lacquer

Final finish on pianos mysteriously going "sour." Production halted. Lab needed X-ray diffraction camera to identify impurity. At 9 A.M., 10-lb. camera Air Express-ed from 1100 miles away, delivered by 4 P.M. *same day*. Cost, only $3.58. Company uses Air Express as routine method to get supplies fast, keep inventory low.

That low $3.58 figure was total cost for Air Express and included door-to-door service. That makes the *world's fastest* shipping method exceptionally convenient, complete, and easy to use.



Scheduled Airlines carry Air Express on every flight. Speeds up to 5 miles a minute! Direct by air to 1300 cities; air-rail for 22,000 off-airline offices. Serves many foreign countries, too.

FACTS on low Air Express rates

Package of blueprints (4 lbs.) goes 800 miles for $1.54.
Special tools (21 lbs.) go 600 miles for $3.87.
(Every kind of business finds Air Express pays.)

Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
AIR EXPRESS
GETS THERE FIRST

Rates include pick-up and delivery door to door in all principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

Ohio, highway contractor who had done considerable work for the Ohio Highway Department, died June 5.

W. J. Mallon, 50, superintendent of ways and structures for the South Shore Railroad, and member of the city sanitation board at Michigan City, Ind., died June 2.

Charles A. Wilson, 64, surveyor and assistant city engineer for 30 years in Youngstown, Ohio, before retiring two years ago, died June 6. He had served under six city engineers, and was a graduate of Ohio Northern University, Ada, Ohio, in 1910.

Wright S. Cockroft, superintendent of construction and Assistant City Engineer, St. Paul, Minn., died May 26.

Harlaw D. Forker, 48, a civil engineer with the Chicago and Eastern Illinois Railroad and a native of Danville, Ill., died June 3.

William D. Wiggins, 76, of Merion, Pa., who, before his retirement in 1943, was vice-president in charge of engineering for the Pennsylvania Railroad, died at Bryn Mawr, June 12. A graduate of Rose Polytechnic Institute, Terre Haute, Ind., in 1895, he immediately joined the railroad as a rodman. He was made superintendent of the Peoria division in 1912. After steady promotions he became chief engineer of the system in 1935.

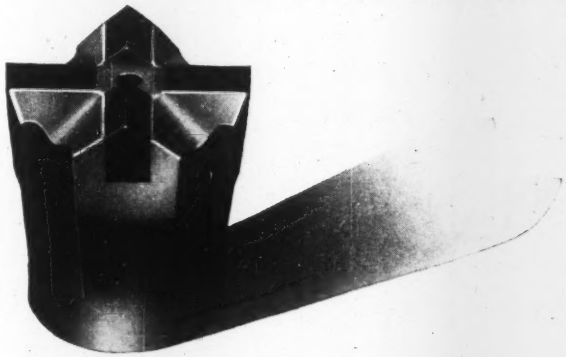
Ralph W. Mabe, 47, assistant chief engineer for the Nashville, Chattanooga & St. Louis Railway, was killed June 10, when his BT-13 plane crashed near Gallatin, Tenn. He was flying from Cartersville, Ga., where the new railroad relocation near the Allatoona Dam reservoir had been opened to traffic.

Earl C. Elliott, 70, an employe of the water utility in San Francisco for several years, died there June 8. He was graduated from DePauw University, Ind., and became superintendent of the Kokomo Water Works Co., Kokomo, Ind. Later he was the first city manager of Wichita, Kan.

Charles Skelton Thompson, 69, paving construction executive in North Carolina, died June 4, in Gastonia, N. C. For many years Mr. Thompson was vice-president and treasurer of the Noll Construction Co. For the last few years, he and his nephew, Fred N. Thompson, of Charlotte, N. C., were associated in a firm of highway builders. Many of the highways of North and South Carolina were built by them.

Carset Jackbits

Drill faster, 50% or more
Boost tonnage 20% or better
Finish more rounds per month!



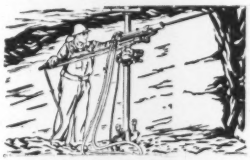
Now it has been Proved that you can do this, and much more, with the I-R CARSET JACKBIT

More than two years of actual field experience have given positive proof of what the CARSET JACKBIT can do – under all drilling conditions, in all kinds of rock. The results today are creating a complete revolution in rock-drilling performance and economy.

For here is a Carboloy-set bit that is repeatedly out-drilling and out-lasting a steel bit usage by 50-to-1, 100-to-1, and in many cases as much as 400-to-1! Uniformly high drilling speed is maintained for the full depth of the hole – without the progressive slackening in speed of quick-dulling steel bits. Bit changing is practically eliminated, longer steel changes can be used, and single-gauge holes can be drilled to any practical depth. This means more efficient drilling cycles, more rock or ore broken per shift – usually *20%* or more.

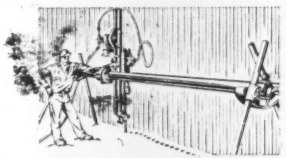
For the complete story on the CARSET JACKBIT, write today for your copy of our new 36-page, pocket-size catalog, Form 4091.

HERE ARE A FEW TYPICAL REPORTS ON CARSET PERFORMANCE

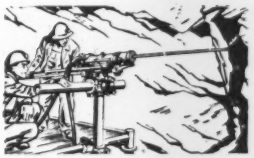


A MINING COMPANY, drilling in a very hard quartzite, reports that CARSET JACKBITS have so multiplied drilling speed that miners can now drill and blast on the same shift. With steel bits, blasting previously had to be done on the second shift. This customer has converted to CARSET JACKBITS 100%.

ON A LARGE DAM PROJECT, 2" CARSET JACKBITS were used with 4" Wagon drills operating in hard dense basalt. These bits drilled 24-ft. holes in 22 minutes, while steel bits previously used required 66 minutes for an 18-ft. hole (with 10 bit changes). Footage was increased from 120 to 261 ft. per shift.



IN A GRANITE QUARRY, CARSET JACKBITS have given such outstanding performance that steel bits are no longer used. Previously, with quick-dulling steel bits, the bit reconditioning shop had to be run two 8-hour shifts a day. This operation has now been almost eliminated.



A MINING COMPANY, in driving a 12 x 20 foot 97-hole heading in taconite, required an average of 49.8 hours to pull a 5-foot round. With CARSET JACKBITS they pulled 6½-foot rounds and cut this time to 18.5 hours. Accurate cost records showed a direct saving of $92.69 per foot of drift, or $602.48 per round.

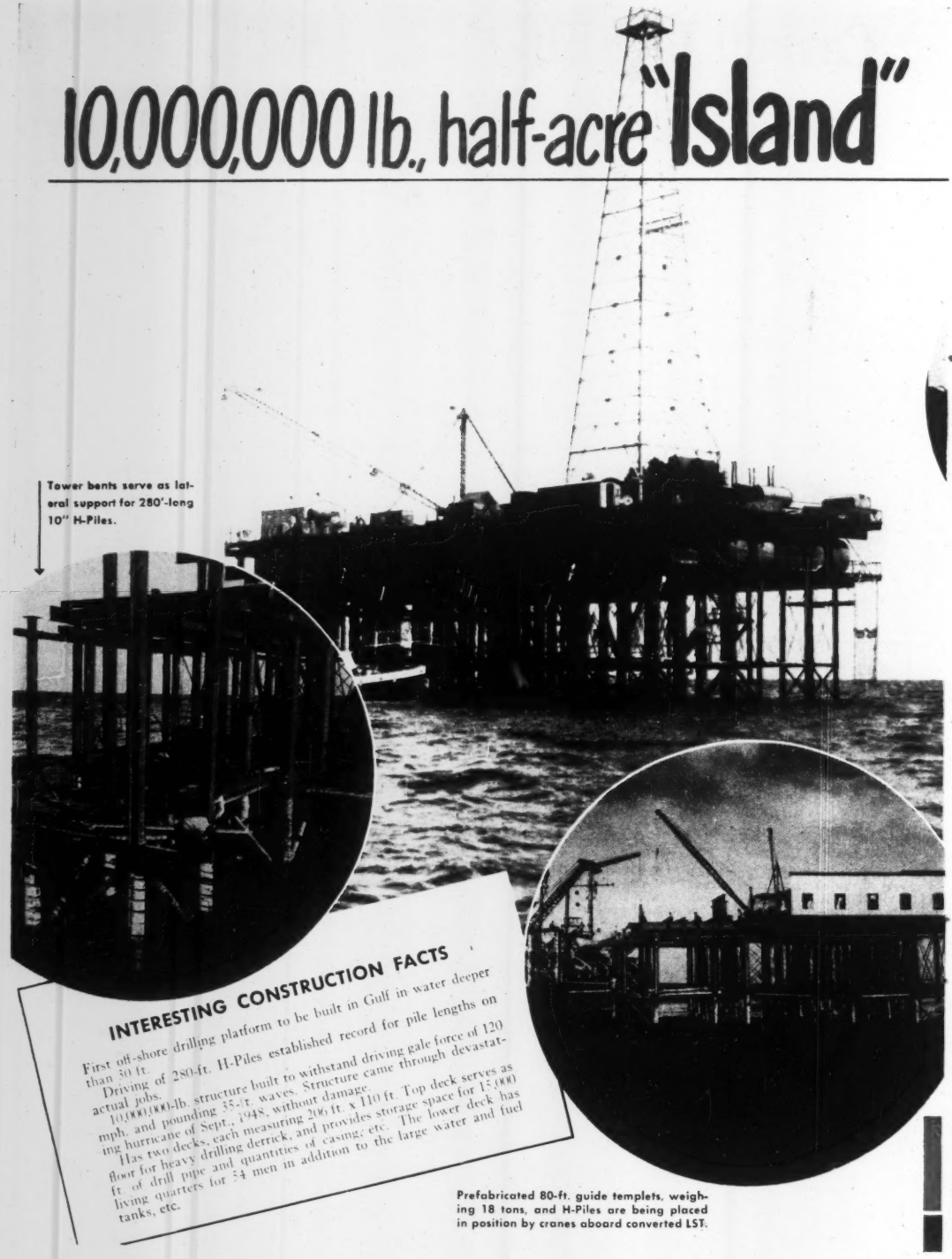
manufactured exclusively by

409-15

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y

10,000,000 lb., half-acre "Island"



Tower bents serve as lateral support for 280'-long 10" H-Piles.

INTERESTING CONSTRUCTION FACTS

First off-shore drilling platform to be built in Gulf in water deeper than 30 ft.

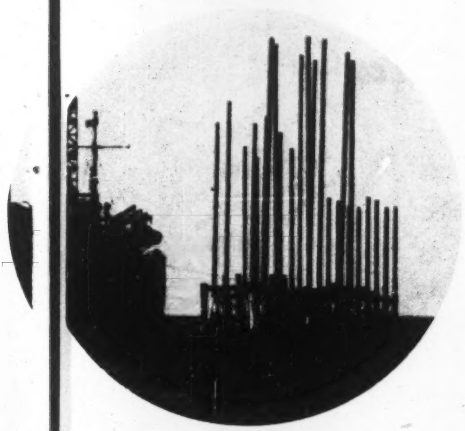
Driving of 280-ft. H-Piles established record for pile lengths on actual jobs.

10,000,000-lb. structure built to withstand driving gale force of 120 mph. and pounding 35-ft. waves. Structure came through devastating hurricane of Sept., 1948, without damage.

Has two decks, each measuring 200 ft. x 110 ft. Top deck serves as floor for heavy drilling derrick, and provides storage space for 15,000 ft. of drill pipe and quantities of casing, etc. The lower deck has living quarters for 54 men in addition to the large water and fuel tanks, etc.

Prefabricated 80-ft. guide templets, weighing 18 tons, and H-Piles are being placed in position by cranes aboard converted LST.

in 50 feet of Hurricane-Swept Water



H-Piles of prefabricated sections in lengths up to 280 ft. are driven to penetrations of 154 to 200 ft.

SUPPORTED BY

U·S·S Steel H-Piles

100 steel piles up to 280 ft. long used in construction of drilling platform 8 miles out in gusty Gulf.

TOWERING high above everything in sight and covering an area one-third the size of a football field, the huge stationary oil drilling platform shown here is the first to be built in the open Gulf of Mexico, in water deeper than thirty feet.

Designed and constructed by the W. Horace Williams Company of New Orleans, for a leading oil company, the project represents a truly remarkable engineering feat. Its location posed problems never before encountered. The site is eight miles off the Louisiana coast in 50 ft. of water, and in a particularly treacherous part of the Gulf. Any structure built there had to be strong enough to withstand driving gales of 120 mph. and pounding 35-ft. high waves. That the all-steel structure could do it was proved when it came through the September, 1948, hurricane with no damage whatsoever.

The giant 10,000,000-lb. structure rises like a ten-story building from the bottom of the ocean, with the 210-ft. x 110-ft. derrick platform standing 60 ft. above the surface of the water. It is supported by 100 U·S·S Steel H-Beam Bearing Piles in lengths up to 280 ft. and having a penetration ranging from 154 ft. to 200 ft. The steel piles are 10-inch sections weighing 57 pounds to the foot and are driven in several lengths and spliced by both bolting and welding. Approximately 900 tons of U·S·S Steel H-Beam Bearing Piles, and 700 tons of U·S·S Structural Steel went into the completed project.

The construction of this unique off-shore oil drilling platform is further proof that for deep penetration and high load capacity, you can't beat steel. U·S·S Steel H-Beam Bearing Piles penetrate with ease through all types of unstable substrata materials to provide a secure means of supporting foundations at great depths. For detailed information on U·S·S Bearing Piles and other U·S·S Engineering Products, contact the office nearest you.

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **STEEL H-BEAM BEARING PILES**

UNITED STATES STEEL

LOW BIDDERS--

Need WAYNE CRANE *Now!*

For Economies that make more Profits—both the Model 22 and the Model 44 Corsair

DO SO MANY DIFFERENT JOBS *Quicker-Better*

SPECIFICATIONS
Model 22 as a Shovel • ½-yard • 5-ton Self-propelled • One-man Operation

SPECIFICATIONS
Model 44 "Corsair" as a Truck-Crane • ½-yard • 10-ton Tandem Drive • 10 Speeds forward, 2 reverse

WAYNE CRANE MODEL 44 "*Corsair*"

offers truck speeds on the highway PLUS added power and traction for on-the-job work. The full-vision cabs simplify signaling between operator and driver. Easily convertible to all attachments, the Corsair is designed throughout to provide maximum stability.

MODEL 22 IS A

real PROFIT-MAKER on basement, sewer, ditch and all similar jobs. 360° operation with equal efficiency and stability. Short turning radius and 92" wheelbase mean maximum maneuverability. One-man operation—single engine power—easy to maintain and lubricate. Both operators and mechanics like Wayne Crane. Easily convertible to trench hoe, dragline, clamshell, crane and magnet.

WAYNE CRANE owners know that these machines cost less to operate. We know it because our "parts" business is small.

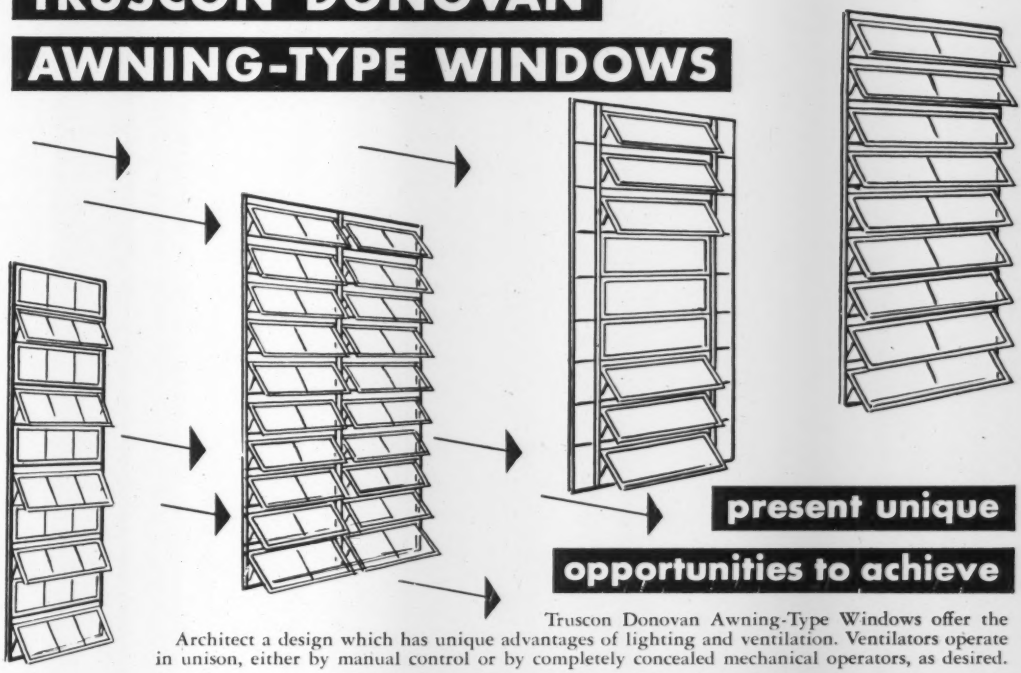
Operating cost is again MIGHTY IMPORTANT—bids are lower—profits are smaller. Better look at Wayne Crane NOW. These machines are real COST-CUTTERS.

YOU ARE INVITED

to visit or call a Wayne Crane Distributor for help on any equipment problem. They are good men to know. Complete service and parts facilities are maintained by Wayne Crane Distributors in all principal cities.

Mfd. by WAYNE CRANE DIVISION—AMERICAN STEEL DREDGE COMPANY INC.—Fort Wayne 1, Indiana, U. S. A.

TRUSCON DONOVAN AWNING-TYPE WINDOWS



present unique opportunities to achieve distinctive institutional structures

Truscon Donovan Awning-Type Windows offer the Architect a design which has unique advantages of lighting and ventilation. Ventilators operate in unison, either by manual control or by completely concealed mechanical operators, as desired.

The awning principle of the open ventilators permits the admission of air in inclement weather. Fully opened, the windows afford approximately 100% ventilation. Fixed panels may be located wherever you wish.

The Donovan design completely eliminates all unsightly exposed connecting arms, screws, racks, etc. These Truscon Steel Windows are sturdily built of unusually heavy special casement sections. They are positively and easily operated, assuring you of a high quality product incorporating features not available in any other window design.

Above: Hillman Junior High School, Youngstown, Ohio. Excellent use of Truscon Donovan Awning-Type Windows.

Below: Truscon Donovan Awning-Type Windows used in Ripley Memorial, Houston, Texas.

New Literature. *Send for new catalog complete with installation details and specifications on Truscon Steel Windows for every type of residential, commercial, industrial and institutional use.*

TRUSCON STEEL COMPANY
YOUNGSTOWN 1, OHIO
Subsidiary of Republic Steel Corporation

Manufacturers of a Complete Line of Steel Windows and Mechanical Operators • Steel Joists • Metal Lath • Steeldeck Roofs • Reinforcing Steel • Industrial and Hangar Steel Doors • Bank Vault Reinforcing • Radio Towers • Bridge Floors.

LOOK TO **P&H**

FOR ADDED VALUES

(Above) A P&H Model 655 (1½ yard). Important features include all-welded construction of rolled alloy steels, low pressure hydraulic control — true tractor type crawler — and many others you can't get in other machines, or, if available, cost you extra.

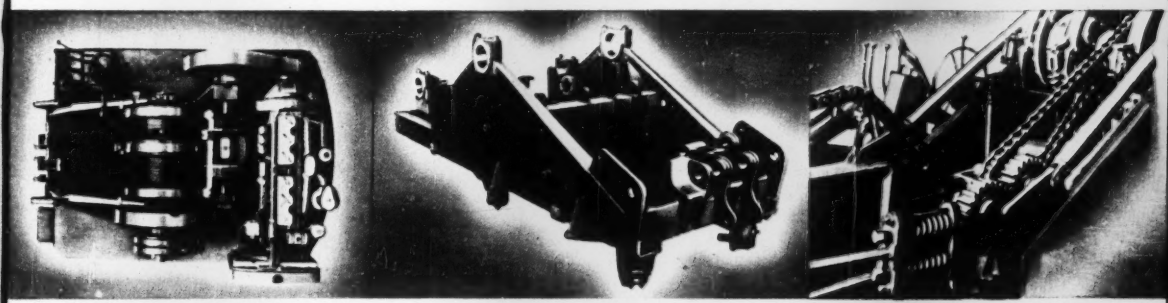
DIGGING POWER

per pound of weight

another P&H added value

Sit at the controls of a P&H and you'll know what we mean. It's *designed* — from crawlers to boom point — to put more *dig* at the tooth point! Deadweight's out! Live weight does it — makes the difference in faster, easier digging. And that means lower costs on any job.

Here are some of the ways you gain maximum capacity in relation to total machine weight:



1. YOU SWING LESS DEADWEIGHT. Machinery units on upper deck are placed far back of center to counterbalance digging end. This trims off hundreds of pounds of clumsy ballast — peps up the swing — reduces strain.

2. YOU CARRY LESS TOTAL WEIGHT. This modern P&H revolving frame weighs only 2/3 as much as old style frames for same size machine. Yet rolled alloy steels, all-welded, make it the strongest for its size ever built.

3. YOU HAVE FULL ENGINE POWER ON EVERY BITE with P&H's planetary chain-crowd. It's rapid-reversing—50% faster on retract. Action is smooth, responsive, accurate — you can control it to within 1 inch of grade.

Buy your next excavator on the basis of more digging power per pound of weight. You'll be money ahead — and years ahead — with P&H.

Ask your P&H Dealer to show you the new sound-color film "Added Values." Every excavator user should see it.

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LARGEST COMMERCIAL BLAST USES 1,362,985 LBS. OF "NITRAMON"*

Produces estimated 1,800,000 cu. yds. of rock fill for T.V.A.'s South Holston, Tennessee, Dam

BEFORE 5,254 lineal feet of coyote tunnel were driven into the base of a huge hill of stratified sandstone. Three main adits with a total of 44 cross-cuts were required. Charge was divided into 190 units totaling 55,452 cans of "Nitramon" and 436 "Nitramon" primers, connected by about 4 miles of Primacord. Loading was accomplished in 17 working days.

Photo at right, taken just after the blasting switch was thrown, shows the whole burden of this record blast at the height of its lift. Note that the trees in the background are hidden by the crumbling hill.

AFTER Nearly two million cubic yards of well broken rock, ready for the shovels.

This is the fifth, and largest, of a series of six coyote tunnel blasts made with "Nitramon" in the same general locality.

1.	September 11, 1947.....	316,486 pounds
2.	November 8, 1947.....	526,925 pounds
3.	March 11, 1948.....	422,563 pounds
4.	July 14, 1948.....	844,503 pounds
5.	February 5, 1949.....	1,362,985 pounds
6.	April 16, 1949.....	501,112 pounds
		3,974,574 pounds

Contractors can improve the safety, economy and efficiency of their quarry operations with Du Pont "Nitramon." Ask your Du Pont Explosives Representative for full information. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

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A Product of Du Pont Explosives Research

*Reg. trade mark for Du Pont nitrocarbonitrate blasting agent.

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CONSTRUCTION REPORTS

Proposed Work—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.
ELSIE EAVES, Manager J. A. MAHONEY, Reports M. R. ROESSLER, Statistics

WATER SUPPLY

Calif., Palo Alto—City, City Hall, voted $400,000 bond water sys. imprvs. CD 4/28.

Calif., Santa Barbara—City, constructing 4½ m.g. gunite lined reservoir, approx. 54,000 cu. yd. excav. $100,000. Chester W. Moore, city engr.

Ind., New Castle—Bd. P. Wks., City Hall, WW imprvs., incl. 30,000 ft. watermains, 1 m.g. water storage tank, $550,000. Ernest L. Guyer, 1311 Church St., city engr. CD 8/22/46—ENR 9/5/46.

Ia., Council Bluffs—City, City Hall, brick, stone water purification plant, filter plant, pumps, chemical storage, shop. $500,000. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., consult. engrs.

La., Opelousas—City, watermain extens., $175,000; doubling capacity filtration plant. $125,000.

Minn., Columbia Heights — City, P. T. Olsson, mgr., City Hall, WW imprvs., incl. supply mains, 250,000 gal. tank, pump station, etc. $281,000. R. D. Thomas & Assoc., 46 Metropolitan Life Bldg., Minneapolis, engrs.

●**N. D., Minot**—City, water treatment plant and sewage disposal plant. $1,000,000. Pfeifer & Schultz, Wesley Temple Bldg., Minneapolis, Minn., consult. engrs. CD 1/15/45—ENR 1/25/45.

●**O., Dayton**—Dpt. Water, City Hall, Belmont Elevated Tank, $350,000; Germantown Reservoir, $1,287,000; main pump station, $250,000; filtration and softening plant, $3,664,000; suction reservoir, $238,000, outside purchs. $225,000; raw water collection conduit—addns. $100,000; waterlines, Connecticut Ave., $65,069; Robert Blvd. and First St. $40,250 Western Ave., $81,300; Grantont Trace to Eastern Sts., $14,900; Germantown Feed line, $94,000; Ridge Ave. annexation distr. $58,672. John F. Hale, city engr. CD 9/28/45—ENR 10/11/45.

O., Massillon—Ohio Water Service Co., 235 State Struthers St., Youngstown, increase capacity and imprv. water service. Approx. $500,000.

O., Youngstown—Ohio Water Service Co., 235 State Struthers St., install 1 m. g. standpipe, mains. $200,000.

Pa., New Freedom—New Freedom Boro, reservoir and water supply sys. $100,000. Brady & Horton, 920 Washington St., Reading, consult. engrs.

●**Tex., Austin**—City, City Hall, voted bonds, water plant and sys. imprvs., extens. $1,000,000. CD 4/28.

Tex., Gatesville—City voted $180,000 bonds, waterworks incl. well. Paul Gregory, Gatesville, consult. engr. CD 4/28—ENR 5/26.

Utah, Bountiful—City, c/o Wilfred H. Williams, redr., voted bonds impvmt. WW, $250,000. Win Templeton, Dooly Bldg., Salt Lake City, engr.

Que., Montreal—Municipality, pumping station, McTavish St. reservoir, $1,000,000. H. A. Gibeau, city engr.

SEWERS, WASTE DISPOSAL

Calif., San Bernardino—City, 12- to 30-in. interceptor sewer mains in Arrowhead Ave., 13 and 28 St. $150,190. CD 10/31/45—ENR 11/29/45.

Calif., Taft—Taft City, Taft Heights, Ford City, sewage disposal plant and truck lines, $182,569. R. E White, 1716 Oak St., Bakersfield, consult. engr.

Ind., Indianapolis—Bd. P. Wks., City Hall, sanitary sewers, city limits, to University Heights, near here. $170,000. M. G. Johnson, city engr. CD 6/4/45—ENR 6/14/45.

Ind. West Lafayette—City Council, R. Ostermeir, clk., West Lafayette, voted $180,000 bonds, sanitary and storm sewers. CD 12/3/43—ENR 12/9/43.

Kan., Junction City,—City, City Hall., storm sewers, sewage plant, $100,000. Wilson & Co., 223 N. Santa Fe St., Salina, consult. engrs.

La., Houma—City, City Hall, voted $100,000 bonds to combine natural gas and sewerage sys. CD 4/10/44—ENR 1/27/44.

Mass., Wakefield—Town, Water & Sewer Dpt., Town Hall, 3,840 lin. ft. 12 and 16 in. c. i. sewers, 31,070 lin. ft. 8 in. c. i. house sanitary sewers. Approx. $100,000. Weston & Samuson, 14 Beacon St., Boston, engrs.

Mich., Adrian—City, City Hall, sewage disposal paint. $800,000. Fryewry, McNamee & Porter, Ann Arbor, consult. engrs.

Mich., Battle Creek—City, City Hall, 11,021 lin. ft. sidewalk, 20,186 ft. sanitary sewers, 12,859 ft. curb and gutter, b. conc. resurf. roads. $259,286. CD 11/30/44—ENR 12/14/44.

Minn., Mapleton—Village, E. J. Zoch, clk., Village Hall, sanitary sewerage sys., treatment plant. $200,000. Hitchcock & Estabrook 521 Sexton Bldg., Minneapolis, consult. engrs.

●**N. C., Raleigh**—City, Roy Braden, mgr., sewage disposal plant. Approx. $2,000,000.

O., Dayton—Dpt. Service & Bldgs., City Hall, interceptor sewer, Floral to Webster, $350,000; Mundale-Lynhurst exten., $76,200; Stanley Ave. from Leo to Keowee St., $69,400; addnl. secondary, settling capacity, $75,000. John F. Hale, city engr. CD 10/23/45—ENR 11/15/45.

●**O., Hamilton**—City, M. C. Thomas, mgr., Municipal Bldg., plans by Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago; Ill., sewage plant, intercepting and relief sewers. Low Head River Dam, garbage incinerator, $3,000,000-$4,000,000. A. A. Smalley, city engr. CD 11/14/45—ENR 11/29/45.

Tex., Austin—City, voted bonds, sanitary sewers. $500,000. CD 4/28.

Tex., Halletsville—City, storm sewers, $100,000. Walter H. Lilly, Transit Tower Bldg., San Antonio, consult. engr.

Tex., Hondo—City, grading, drainage, gutters, storm sewers $200,000. Alamo City Engineers, 3005 Transit Tower, San Antonio, consult. engrs.

Tex., Houston—City, City Hall, 900 Brazos St., Harris Gully Storm Sewer Proj. 2. $300,000. R. W. Lee, 3748 Olympia St., consult. engr.

●**Tex., Houston**—City, Oscar Holcombe, mayor, 900 Brazos St., storm sewers, $8,000,000; sanitary sewers, $10,000,000. M. Nagle, city engr. CD 9/18/47—ENR 10/2/47.

Tex., Pasadena—City, sanitary sewer lines, for newly annexed areas, $400,000. George H. Smith, Pasadena, consult. engr.

Utah, Bountiful—City, c/o Wilfred H. Williams, redr., voted bonds, sanitary sewerage sys., sewage disposal plant. $600,000. Caldwell, Richards & Sorenson, Templeton Bldg., Salt Lake City, engrs.

●**Va., Roanoke**—City, Municipal Bldg., bond election about Sept. 1, sewerage interceptor sys., 24- to 42-in. pipe, $1,500,000, CD 6/30/44—ENR 5/13/44. Sewage treatment plant, $1,900,000. Mattern & Mattern, 118-A Campbell Ave., S. W., Roanoke, Va. and Alvord, Burdick & Howson, 20 N. Wacker St., Chicago, Ill., consult. engrs. CD 2/28—ENR 3/17.

BRIDGES

Connecticut—State, G. Albert Hill, hy. comr., State Office Bldg., Hartford.

New Milford—steel span rein.-con. hy. bridge over Housatonic River via Bridge St. $200,000. Joseph D. Drury, State Hy. Dpt., engr.

●**Ill., Cairo**—Illinois Central R.R. Co., C. H. Mottier, vice pres. and ch. engr., 109 E. Roosevelt Rd., Chicago, steel, stone, masonry bridge. $6,000,000.

●**Ill., Chicago**—City, Dpt. P. Wks., Oscar E. Hewitt, comr., City Hall, steel highway bascule bridge over South Branch Chicago River, W. Congress St. $3,000,000. CD 3/19/45—ENR 4/5/45.

●**O., Cleveland**—New York Central R. R., E. A. Dougherty, ch. engr. (west of Buffalo) LaSalle St. Station, Chicago 5, Ill., plans by Howard, Needles, Tammen & Bergendoff, 921 Walnut St., Kansas City, Mo., vertical lift bridges at mouth of Cuyahoga River between Callision and Irishtown Bends, incl. replacing present bridges with new vertical lift bridges with 300 ft. opening, structural steel concrete abutment and pier, wood cross ties. $4,000,000.

O., Youngstown — Comrs. Mahoning Co., Youngstown, 36 ft. steel, concrete bridge across Kreider entrance to Mill Creek Park as link with West Blvd. as part of opening Glenwood Ave. exten., along West Blvd. $300,000. Samuel Gould Jr., Courthouse, engr. CD 3/16/44—ENR 4/6/44.

†**Tex., Camp Hood (P.O. Killeen)**—U. S. Eng., 606 Santa Fe Bldg., Galveston, highway bridge. $150,000.

Quebec and New Brunswick — Dominion Govt., Ottawa, Ont., bridge between Cross Point, Que., on Gaspe Peninsula to Campbellton in Restigouche Co., N. B. $100,000.

Quebec—Province of Quebec, Quebec City.

Rimouski — bridge over Madeline River, $100,000.

Que., Drummondville—City, M. Marier, clk., and Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, subway under Canadian National Railway tracks, Linsay Place. Approx. $350,000. O. Bessett, c/o owner, engr. CD 11/9/45—ENR 11/11/45.

STREETS AND ROADS

Calif., San Diego—City, Civic Center Bldg., b. conc. and subgrade Chalcedony St. $182,196. Alden K. Fogg, city engr. CD 12/6/44—ENR 12/28/44.

Colo., Denver—City and Denver Co., City & County Bldg., concrete gutter, curb and curb walk and 3 in. grav. base course and necessary incidental imprvs. $279,600. Terry Owens, City & County Bldg., Denver, city engr. CD 4/26—ENR 5/26.

●**Connecticut**—State, A. Albert Hill, hy. comr., Hartford.

Bridgeport—rein.-con. expressway thru city to eliminate traffic congestion and speed-up travel. $7,500,000. R. E. Jorgensen, hy. engr.

Conn., Norwich—City, P. Wks. Dpt., City Hall, repairing, imprv. various streets. $150,-600. Chandler & Palmer, 16 Franklin St., consult. engrs. CD 2/18/47—ENR 3/6/47.

Idaho, Idaho Falls—City, City Hall, paving 8.18 mi. streets, alleys, 13.86 mi. sidewalks, 16.71 mi. curbing, LID 21. $585,624. C. R. Black, city engr. CD 8/17/45—ENR 9/6/45.

Mich., Kalamazoo—City, City Hall, 1949 street paving program, $200,000.

N. M., Clovis—City, Bob Vineyard, mayor, City Hall, plans by Hasie & Green, engrs., and archts., Wilson Bldg., Lubbock, Tex., street paving incl. 200 blocks of concrete curb and hot mix asph. surf. gutter. $500,000. CD 9/11/46—ENR 10/3/46.

O., Dayton—Dpt. Service & Bldgs., City Hall, main thorofare openings and major widening, Union Ave., new connection from Brown to Alberta Sts., $80,000; paving, resurf. and minor widn. Robert Blvd. from Third St. to Monument Ave., $50,000; First St. from Stratford Ave. to Robert Blvd. $62,100; Lee St. from Keowee to Webster Sts., $54,500; Monument Ave. from Keowee to Pindlay Sts., $100,000; Salem Ave. from Catalpa to Phila. Drive, $224,900. John F. Hale, city engr. CD 11/28/45—ENR 12/13/45.

Okla., Enid—City, defeated bonds, street resurf., $199,000. V. G. Thompson, 1100 W. Main St., Oklahoma City, consult. engr. CD 5/9.

Okla., Oklahoma City—City, City Hall, resurf. 3 blocks Broadway from Main to Park Sts. $175,000. H. E. Chase, city engr. CD 10/29/45—ENR 11/15/45.

Okla., Oklahoma City—Stanford Houses, Inc., 1105 S. W. 20 St., grading, paving streets in Campbell Terrace Addn. $100,000. Harry E. Becker, Cortez Bldg., consult. engr.

Tex., Bellaire—City, J. H. O'Neil, acting mgr., voted bonds, street imprvs., paving, $300,000. CD 5/9.

●**Tex., Houston**—City, Oscar Holcombe, mayor, City Hall, 900 Brazos St., street paving and topping, $10,000,000. M. Nagle, city engr. CD 11/22/44—ENR 12/14/44.

●**Tex., Paris**—Lamar Co., Courthouse, county-wide farm-to-market road. $1,130,000.

●**Tex., Wharton**—Wharton Co., Courthouse, Wharton, grading, drainage structures, flexible base, Precinct 3, $666,640; Precinct 4, $958,295. Mc Cormick & Teller, 2711 Grant St., Houston, consult. engrs. R. D. King, co. engr. CD 11/8—ENR 11/24.

• **Manitoba**—Province of Manitoba, Winnipeg.

Clearwater-Crystal Bay—grav. 7 mi., $60,000.

Crystal City-Pilot Mound—grav. 7.5 mi. $140,000.

Melita-Medora—grav. 12 mi. $200,000.

Westbourne—grav. 13 mi. $275,000.

Woodside-Westbourne—grav. 9.5 mi., $400,-000.

●**Ont., Toronto**—Secy. Bd. Control c/o City, H. E. McCallum, mayor, exten. St. George St. to Russell Hill Rd. Approx. $3,283,321. M. Stewart, c/o owner, engr.

EARTHWORK, WATERWAYS

●**Calif., El Centro**—Imperial Irrigation Dist., $12,500,000 bond election June 15, power system addns. 12/27/44—ENR 1/11/45.

Fla., Palm Beach—City, dredging, rehabilitation harbor facilities. $250,000.

Fla., St. Augustine—City, jetty, dredging channel and imprv. shipping facilities. $137,-500. Gilbert A. Youngblood Assoc., Graham Bldg., Jacksonville, consult. engrs.

Fla., St. Petersburg—St. Petersburg Port Authority, dredging and other harbor imprvs. $208,300.

N. Y., Hempstead—Town Bd. Supervs., Hempstead, 2 jetties at Clayton and Troy Aves., at East Atlantic Beach Park. $320,000.

O., Dayton—Dpt. Service & Bldgs., City Hall, diversion dams and flood basin. $115,000. John F. Hale, city engr.

Pennsylvania—Dpt. Forests & Waters, Education Bldg., Harrisburg, flood control and stream channel work in Potter, Tioga and McKean Counties, $300,000; reconstruct. repair aqueducts, bridges and locks on Delaware Division of Old Pennsylvania Canal, $95,000.

●†**Texas**—U. S. Eng., c/o J. B. Lusk, end of Frytania St., New Orleans, La., Ferrell's Bridge Reservoir and Dam, Cypress Creek, Jefferson Area. $6,000,000.

●†**Texas**—U. S. Eng., 606 Santa Fe Bldg., Galveston, flood control dam, below Lake Brownwood and spillway control gates, Brown Co. $9,035,000.

Tex., Houston—Katy Park Industrial Development Corp., Tom C. Mabry, vice pres., c/o M. K. T. Ry. Lines, 1811 Ruiz St., plans by Wyatt C. Hedrick, 5201 Fannin St., drainage, grading, leveling for huge industrial area. $500,000.

†**Washington**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, raising jetty at mouth of Quillayte River 10 ft., dredging channel

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AIRPORTS AND AIRBASES

●††**Fla., Cocoa**—GUIDED MISSILE TEST CENTER—U. S. Air Forces Defense, Wash., D. C., first unit of $200,000,000 guided missile test center at Banana River Naval Air Station, on Merritt Island, near here. **$75,000,000.**

†**Neb., Fort Crook**—HOUSING—U. S. Eng., 1709 Jackson St., Omaha, reconstructing barracks for troop housing at Offutt Field Air Base.

●**N. J., Newark**—RUNWAY SYSTEM—Port of New York Authority, 111 Eighth Ave., New York, 11, N. Y. runway sys. from 6,000 to 9,000 ft. long at Newark Airport. **$20,000,000.**

Pa., Reading—AIRPORT—City, c/o J. A. Gingrich, City Hall, Reading Municipal Airport alterations, addns. **$500,000.**

†**Tex., Austin**—AIR FIELD IMPRVS.—U. S. Eng., 606 Santa Fe Bldg., Galveston, WW **$65,000**; sanitary sewers, **$60,000**; grading, levelling, drainage, paving, **$75,000**, at Austin Bergstrom Air Force Field. CD 10/26—ENR 11/11.

†**Tex., El Paso**—AIR FIELD IMPRVS.—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., aviation fuel and supply storage, **$250,000**; paving **$500,000**; WW, **$100,000**; sanitary sewers, **$90,000**; site grading, drainage, levelling, **$75,000**, at Biggs Field Air Force Base.

●**Alaska**—WARM-UP SHELTERS—U. S. Eng., (AIC) 942, c/o PM, Seattle, Wash.) Anchorage, warm-up shelters for aircraft at various locations. **$1,000,000.**

FOREIGN

Greece, Athens—Athens Piraeus Electric Co. Ltd., Athens, plans steam electric plant addns. Will purchase steam turbine, diesel generating units, 2 high pressure boilers, 2 low pressure boilers, transformers, switchgear, insulators and wooden poles. **$6,000,000** (incl. $3,060,000 for purchase of U. S. Equip.).

LATIN AMERICA

Mexico—National Railways of Mexico, Bolivar 19, Mexico, D. F., plans by Jorge Medellin, Palma 32-505, Mexico, D. F., grand central passenger station, Mexico City, freight depot, Santa Maria. **$40,000,000.** CD 3/29—ENR 4/8/48.

Mexico, Acambaro—Mexican Govt., Srta. de R. R., Balderas, 94, Mexico, D. F., plans WW expans and modernization. **$350,000.**

Mexico, Caborca—Mexican Govt., Srta. de Resursos Hidraulicos, Balderas, 94, Mexico, D. F., plans irrigation dam. **$500,000.**

Mexico, Ciudad Juarez—National Railways of Mexico, Bolivar, 19, Mexico, D. F., plans passenger station and freight depot. **$3,000,000.**

Mexico, El Mante—El Mante Sugar Central, El Mante, Tamps, plans sugar mill enlargement and impvs., irrigation works. **$1,125,000.**

Mexico, Mexico City—Tomas Nino Salgado, Terrazzini, 102, Col. Peralvillo, Mexico, D. F., plans rayon factory. **$100,000.**

Mexico, Monterrey—National Railways of Mexico, Bolivar 19, Mexico, D. F., plans passenger station and freight depot. **$3,000,000.**

Mexico, Reynosa—Mexican Govt., Srta. de C. y O. P., Mexico, D. F., plans civil airport. **$400,000.**

Mexico, Santa Lucia—Mexican Govt., Srta de la Defensa Nacional (Direccion General de Aeronautica) National Defense Ministry, General Direction of Aeronautics, plans military air base **$2,500,000.**

Mexico, Tlalnepantla—Acetos Tlanepantla, S. A., 16 de Septiembre 5, Mexico, D. F., plans steel works. **$1,500,000.**

Santo Domingo, Ciudad Trujillo—Republic of Dominica, Ciudad Trujillo, plans 25,000 bbl. daily capacity, petroleum refinery. **$15,000,000.**

Uruguay, Montevideo—Republic of Uruguay, Montevideo, plans electric power development. **$30,000,000.**

PUBLIC BUILDINGS

Ala., Anniston—City Bd. Educ. plans by Pearson, Tittle & Narrows, First National Bank Bldg., Montgomery, Junior High School **$500,000.** CD 12/11/44—ENR 12/28/44.

Ala., Brewton—City, plans by Charles H. McCauley, Jackson Bldg., Birmingham, hospital. **$250,000.** CD 4/11/46—ENR 5/13/46.

Ark., Conway—Arkansas State Teachers College, Conway, plans by Bruce R. Anderson, Wallace Bldg., Little Rock, dormitory addns. **$450,000.**

Ark., Dumas—Desha Co., c/o J. L. Erwin, plans by Bruce R. Anderson, Wallace Bldg., Little Rock, hospital. **$300,000.** CD 3/17—ENR 3/31.

Calif., Arcata—Arcata Union High School Dist., Arcata, voted **$450,000** bonds high school gymnasium and shop. Masten & Hurd, 526 Powell St., San Francisco, archts. CD 3/31—ENR 4/25.

Calif., Berkeley—Bd. Educ., 1414 Walnut St., plans by Masten & Hurd, 526 Powell St., San Francisco, Garfield Junior High School addn. **$473,000.** CD 11/17—ENR 12/9.

Calif., Culver City—City plans by Hugh Davies, Security Bank Bldg., Long Beach, 1 con. "200 seat auditorium. **$400,000.**

Calif., Costa Mesa—Orange Coast Junior College Dist., voted $2,557,590 for seven year bldg. program, technology bldg. with classrooms and laboratories. **$325,000.** Robert E. Alexander, 3657 S. LaBrea Ave., Los Angeles, archt.

Calif., Dos Palos—Dos Palos Joint Union High School Dist., Dos Palos, voted **$879,000** bonds High school addns. Kump & Falk, 9 Maine St., San Francisco, archts.

Calif., Gonzales—Gonzales Union High School Dist., Gonzales, voted **$350,000** bonds, high school. CD 4/14—ENR 5/12.

Calif., Hermosa Beach — Hermosa Beach School Dist., voted **$364,000** bonds school facilities. Thornton Abell, 469 Upper Mesa Rd., Santa Monica, archt.

Calif., Los Angeles — Bd. Educ., 1425 S. San Pedro St., plans by M. L. Barker and G. L. Ott, 4334 W. Pico Blvd., physical education bld. at Belvedere Junior High School. **$350,000.** A. Nibecker, 1425 S. San Pedro St., engr.

Calif., Madera—Easten-Arcola School Dist., Madera, plans by Fred L. Swartz & W. G. Hyberg, Rowell Bldg., Fresno, school. **$300,000.**

●**Calif., Merced** — Merced Union High School Dist., 19 and G Sts., voted **$1,150,000** bonds, bldgs. at Merced High School and Livingston High School. Frank Wynkoop & Assoc., Fulton-Fresno Bldg., Fresno, archts. CD 4/14—ENR 5/12.

●**Calif., Redwood City**—Sequoia Union High School Dist., Redwood City, voted **$2,150,000** bonds, high school bldgs. CD 5/2.

●**Calif., San Rafael** — Marin Co. Hospital Dist., Courthouse, voted $800,000 bonds 100-bed hospital, **$2,076,000.** Robert Stanton, Box 2177, Carmel, archt. CD 4/5—ENR 4/28.

Calif., Torrance — Torrance Unified School Dist., plans by David, Mann & Johnson, 672 S. LaFayette Park Pl., Los Angeles, North Torrance Elementary School, 12 classroom bldg., administration, shop and homemaking bldgs; **$380,000.**

Colo., Boulder — University of Colorado, Boulder, plans by Trautwein & Howard, 1411 Walnut St., Phila., Pa., and James M. Hunter, Boulder, archts. and engrs., brick, stone physics bldg. **$500,000.** CD 5/23/47—ENR 6/12/47.

Colo., Greeley—Bd. Educ., Greeley, plans by Atchison & Kloverstrom, engrs. and archts., 1254 Monaco Parkway, Denver, Fourth Street Grade School. Approx. **$250,000.** CD 3/18/48—ENR 4/1/48.

Conn., Hartford — Bd. Educ., 249 High St., 750 student brick, steel school, Granby St. Approx. **$250,000;** plans by Carl J. Malmfeldt, 36 Pearl St., 2 story, basmnt., brick, steel school, Southwest Area, **$250,000.**

Ga., Cordele—Crisp Co., Cordele, courthouse and jail. **$350,000.**

Ga., Milledgeville—State, plans by Gregson & Ellis Mortgage, Guarantee Bldg., Atlanta, negro dormitory and dining hall. **$400,000.** CD 11/22/46—ENR 12/26/46.

Idaho, Jerome—Jerome Memorial Hospital Assn., Jerome, plans by Wayland & Fennell, Idaho Bldg., Boise, hospital, **$250,000.**

●**Ill., Chicago**—City, City Hall, plans by Paul Gerhardt, City Hall, arcade bldg. adjacent to terminal. **$2,000,000.**

●**Ill., Evanston** — Northwestern University, Evanston Campus, plans by Holabird Root & Burgee, 180 N. Wabash St., Chicago, 4 story, basmnt., steel mens dormitory, **$1,250,000.**

●**Ill., Springfield** — Bd. Educ., Southside High School, **$1,721,247;** grade school for North East part of city, **$455,789;** Fairview Grade School **$757,894;** Bodda Grade School, **$393,012;** Feitshans High School addn., **$151,261;** Lanphier High School imprvs., addns., **$370,329;** gymnasium auditorium addn. to Bunn School, **$199,354;** Staley School addn., **$373,361;** gymnasium and auditorium addn., Lawrence School, **$177,034.** CD 12/19/45—ENR 2/7/45.

Ind., Fort Wayne—Bd. Comrs. Allen Co., Court House, plans by A. M. Strauss, 415 Calwayne, hospital addn., Irene Byron Tuberculosis Sanitorium. **$100,000.** CD 4/11—ENR 4/28.

Ind., Gary—Bd. School Comrs., Gary, plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., 2 story, brick, rein.-con. Lincoln School, 19 and Polk Sts., **$350,000.** CD 11/26/47—ENR 12/11/47, 2 story, brick, rein.-con. Pulaski School, 18 and Georgia Sts., **$642,000.**

Ia., Council Bluffs — Housing Comn., c/o Chamber of Commerce, E. P. Juel, chn., plans by G. B. Larson, 305 W. Broadway, rental housing. **$400,000.** CD 4/28—ENR 5/26.

Ia., Des Moines—Bd. Educ., 629 3 St., plans by Wetherell & Harrison, Shops Bldg., primary school, 50 St. and Douglas Ave., **$760,000.** CD 2/1/45—ENR 2/22/45.

●**Kan., Lawrence** — Bd. Educ., voted **$1,820,000** bonds, high school addns., Cordley Grade School addn. **$2,620,000.** Griest & Ekdahl, New England Bldg., Topeka, archts. CD 4/28—ENR 5/26.

Kan., Manhattan—State of Kansas, Topeka, plans by Charles L. Marshall, state archt., Topeka, 4 story, basmnt., 165x183 ft. stone, concrete, steel girls dormitory, Kansas State College. **$700,000-$800,000.** CD 4/16/48 — ENR 4/29/48.

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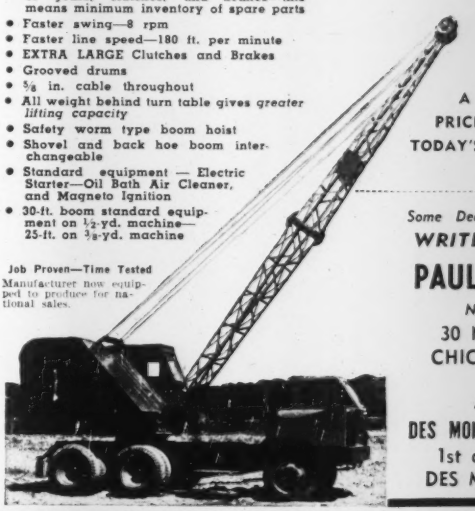

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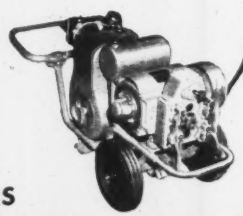

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Kan., Topeka—Washburn Municipal University of Topeka, and Alumni Group, 17 and College Sts., plans by Cuthbert & Suehrk, 735 Kansas Ave., student union bldg. **$250,000.** CD 4/16—ENR 4/29.

● **La., Houma**—Terrebone Parish Police Jury, c/o secy., Houma, **$1,000,000** bond election July 12, hospital.

La., Jennings—State Bd. Educ., Baton Rouge, Jefferson Davis Trade School. **$250,000.**

● **La., Plaquemine**—Iberville Parish School Bd., Plaquemine, **$1,725,000** bond election July 12, school improvs.

● **Me., Augusta**—State of Maine, Dpt. P. Bldg., State House, Augusta, plans by Miller & Beal, Inc., 465 Congress St., Portland, and Desmond & Lord, 6 Beacon St., Boston, 3 story, bsmnt., brick, stone, concrete state house addn., Grove, Capitol and Jackson Sts. Approx. **$3,000,000.** CD 6/26/47.

Me., Bar Harbor — Town, Supt. Schools, Bar Harbor, plans by Ambrose S. Higgins, 200 Main St., 2 story, brick school. **$700,000.** CD 3/13/47—ENR 4/3/47.

Md., Crownsville — Crownsville Hospital, Crownsville, plans by A. C. Rogers, 49 College Ave., Annapolis, 2 story, 30x90 ft., brick, concrete, steel, stone staff quarters. **$250,000.** Public Improv. Comm., 210 E. Lexington St., Baltimore, engr. CD 12/13/44—ENR 12/28/44.

● **Mass., Attleboro**—City of Attleboro Housing Auth., John Turner, chn., City Hall, plans by S. S. Eisenberg, 69 Summer St., Boston, 100 unit housing. **$1,000,000.**

Mass., Canton — Town of Canton Housing Auth., Town Hall, plans by D'Orsi & Co., engrs. and archts., 184 Boylston St., Boston, 25 unit veterans housing. **$250,000.**

Mass., Danvers—Town of Danvers, town clk., Town Hall, municipal hospital, Lindall Hall. Approx. **$250,000.** CD 1/2/45—ENR 1/11/45.

Mass., Danvers—Town, School Dpt., Town Hall, plans by W. H. Jones & Son, 115 W. Emerson St., Melrose, school, Pickering and Otis Sts. **$500,000.**

Mass., Lynnfield—Town of Lynnfield, Oscar Bray, chn. Bldg. Comm., plans by Herman Tucker & Howard L. Rich, assoc. archts., 45 Newbury St., Boston, 1 story, masonry school. Approx. **$250,000.**

Mass., Marshfield — Town of Marshfield, School Dpt., Marshfield, plans by Kilham, Hopkins, Greeley, Brodie, 126 Newbury St., Boston, 2 story, brick school, near Town Hall. **$450,000.**

Mass., Waltham—City of Waltham School Dpt., City Hall, plans by Thomas Worcester, Inc., 31 State St., Boston, trade school. Approx. **$250,000.**

Mass., Webster — Town of Webster Housing Auth., 120 Main St., plans by Cornelius W. Buckley, 311 Main St., Worcester, 31 unit veterans housing, Second Island Rd. **$310,000.** CD 1/6—ENR 1/20.

● **Mass., Wilmington**—Town, Supt. Schools, S. G. Bean, 159 Church St., plans by Sturgis Assoc., Inc., 120 Boylston St., Boston, brick high school, Roman Estate opposite Common. **$1,000,000.**

Miss., Tupelo—North Mississippi Community Hospital, c/o Robert R. McKnight, archt., Tupelo, hospital. **$305,000.** CD 4/11—ENR 4/28.

● **Mo., Kansas City**—Jackson Co., c/o R. H. Van Ness, 207 County Court House, plans by Gentry & Voskamp, 4 W. 13 St., 5 dormitories, central bldg., McCune Home for Boys. **$1,000,000**; dormitory, administration bldg., Hill Top School for Girls. **$289,000.**

Mo., North Kansas City—City, V. J. Woods, secy., City Hall, voted **$375,000** bonds, field house, 23 and Gentry Sts.

Neb., Beatrice — Bd. Educ., Beatrice, voted **$1,084,000** bonds, high school. J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., archt. CD 5/13.

Neb., Holdredge—Bd. Educ., Holdrege, voted bonds, Roosevelt School, smaller school in east part of town. **$170,000.** J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., consult. engr. CD 5/2.

Nev., Carson City—State Div. Hys., Heroes Memorial Bldg., plans by Perry G. Means, Clay Peters Bldg., Reno, 2 story, bsmnt., 170x179 ft., rein.-con. brick office bldg. **$870,000.** CD 11/11/46—ENR 11/28/46.

N. H., Hudson—Town, School Dist., plans by I. W. Hersey & Assoc., Dover Rd., Durham, 2 story high school. **$300,000.**

N. J., Bordentown—Bd. Educ., Bordentown, sketches by Micklewright & Mountford, 72 Ewing St., Trenton, school. **$250,000.**

● **N. J., Haddonfield** — U. S. Dpt. Army, Armory Dr., Trenton, armory. **$300,000**; motor vehicle storage bldg., **$50,000.** Col. H. L. Mack, c/o owner, engr.

N. J., Westmont—Haddon Twp. Comm., 8 Reeve St., school. **$250,000.**

N. C., Rockingham — Richmond Co., A. L. Capel, chn. Bd. Comrs., voted bonds hospital, **$250,000.** CD 5/16.

● **N. C., Rockingham**—Richmond Co. Bd. Educ., J. W. McKenzie, chn. Bd. voted bonds school, **$1,750,000.** CD 5/16.

N. C., Rutherfordton—Rutherford County Hospital, Dr. H. E. Washburn, chn., Bd., Rutherfordton, remodeling, enlarging 70 bed hospital, operating room, laboratories, etc., **$800,000.**

O., Piqua — Bd. Educ., Piqua, plans by Walker, Norwick & Templin, American Bldg., Dayton, high school addn., **$300,000.**

O., Shaker Heights—City, J. W. Main, clk., library, $250,000.

Ore., Monmouth — School Dist. 13, Monmouth, plans by Annand & Kennedy, Central Bldg., Portland, 1 story high school and gymnasium, $400,000.

Ore., Salem—State Bd. Control, Capitol Bldg., plans by L. P. Bartholomew, Salem, hospital at state home for feeble minded, $300,000. J. A. Garson, Capitol, engr.

●**Pa., Harrisburg**—Harrisburg School Bd., 121 Chestnut St., Schimmel School addns., $600,000; Edison Junior High School addns., $750,000; 900-pupil school in vicinity 15 and Vernon Sts., $900,000; 16-12 room school east of Cameron St., $350,000; 600-pupil school in vicinity John Harris High School, $650,000; 750-pupil school Calder and Monroe Sts., $750,000; camp Curtin Junior High School, $1,500,000; 600-pupil Hamilton School $600,000; 600-pupil Cameron School, $600,000.

Pa., Newtown Square—Newtown Township School Bd., Newtown Square, sketches by Lewis P. MacKenzie 117 S. 17 St., Phila., school, Bishop Hollow Rd. $250,000.

Pa., Reading — Reading School Bd., 800 Washington St., plans by Howard L. Eiler, Reading, brick Glenside School addns., imprvs. $250,000.

Tenn., Bristol—City Hospital Bd., c/o Dent & Aydelott, archts., First Natl. Bank Bldg., Memphis, hospital, $500,000-$750,000. CD 5/13.

Tex., Austin—City, Guiton Morgan, mgr., Municipal Bldg., 124 W. 8 St., plans by Page, Southerland & Page, 602 West Ave., Jessech, Jessen, Millhouse & Greven, 112 E. 9 St., and Associated Architects, 305 W. 11 St. and 121 E. 8 St., masonry city hall, police court and health center addns. $410,000.

Tex., Beaumont — Lamar College School Dist., Beaumont, Jefferson Junior College for Negroes, $450,000. Stone & Pitts, 1872 Calder St., consult. engrs. CD 3/3/47—ENR 3/20/47.

Tex., Big Spring—Howard Co., Big Spring, voted bonds, courthouse, $600,000. Puckett & French, 405 Petroleum Bldg., consult. engrs.

●†**Tex., Camp Hood (P. O. Killeen)**—U. S. Eng., 608 Santa Fe Bldg., Galveston, addnl. family housing, $3,000,000.

●**Tex., Corsicana**—Navarro Co. and City of Corsicana, plans by W. G. Clarkson & Co., 1st Natl. Bank Bldg., Fort Worth, 100-bed hospital, $1,200,000. CD 4/20—ENR 5/12.

†**Tex., Daingerfield**—Dpt. of Navy, 18 St. and Constitution Ave., Wash. 25, D. C., laboratory, $361,500; expans. or addn. to wind tunnel, $500,000.

●**Tex., Dallas**—City, City Hall, Main and Harwood Sts. and Dallas Co., Courthouse, voted $7,000,000 bonds, city and county hospital $10,000,000, Roscoe De Witt, Gulf States Bldg., archt. CD 5/2—ENR 5/26.

●**Tex., Highland Park**—Highland Park Independent School Dist., Highland Park, voted $400,000 bonds Hyer, Bradfield and University Park School addns., $450,000 bonds Junior High School; $425,000 bonds Senior High School imprvs., addns.

Tex., Hondo — Hondo Independent School Dist., Hondo voted $250,000 bonds, high school. Charles Hue, Jr., 1805 Transit Tower, San Antonio, engr.

Tex., Sabinal — Sabinal Independent School Dist., voted bonds high school, $250,000. Charles Hue, Jr., 1905 Transit Tower, San Antonio, archt.

Tex., Three Rivers—Three Rivers Independent School Dist., Three Rivers, school, $250,000. H. E. Kellner, 406 Austin Hy., San Antonio, consult. engr. CD 3/29—ENR 4/14.

Utah, Salt Lake City—Bd. Educ., 440 E. First South St., plans by Slack W. Winburn, Beason Bldg., school, 11 West and 9th North Sts. $400,000. CD 12/15—ENR 1/1.

●†**Wash., Bangor**—Yards & Docks Annex, Navy Dpt., Arlington, Va., buildings and accessory constr. for mine assembly facilities at Naval Ammunition Depot, $1,000,000.

†**Wash., Bremerton**—Yards & Docks Annex, Navy Dpt., Arlington, Va., shop for overhaul work on submarine batteries in Bremerton Navy Yard, $600,000.

Wash., Castle Rock—School Dist., 401, Castle Rock, school, $400,000.

●†**Wash., Fort Lewis**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, family quarters and utilities, telephone exchange bldg. and relocation post office and finance bldg., $1,793,000.

Wash., South Bend—Pacific Co., Courthouse, plans by C. W. George & R. B. Price, Becker Bldg., Aberdeen, Pacific County General Hospital, $650,000. Worthen & Wing, Clover Park Bldg., 11129 Gravelly Lake Dr., Tacoma, Zone 9, consult. engrs. CD 11/11—ENR 12/2.

●**Wash., Tacoma**—City, City Hall, plans by S. H. Nelsen, 405 S. Sheridan St., library, $1,125,000. Worthen & Wing, Clover Park Bldg., 11129 Gravelly Lake Dr., Zone 9, consult. engrs. CD 5/2—ENR 5/26.

Wis., West Allis — City, 7525 W. Greenfield Ave., Zone 14, public library addn. $250,000. M. H. Cuffman, 1260 N. Milwaukee St., Milwaukee, Zone 2, consult. engr. Peter H. Burbach, City Hall, city engr.

●**Wyo., Casper** — Bd. Educ., Casper and Natrona Counties, Casper, voted $1,000,000 bonds Junior College, Junior High School, several grade school addns. CD 4/28—ENR 5/26.

Alta., Entwistle—Dominion Govt., Hunter Bldg., Ottawa, Ont., hospital, $250,000.

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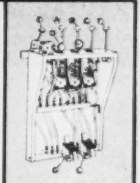

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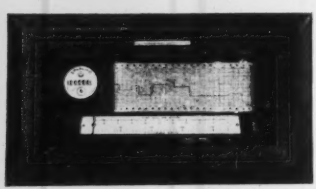

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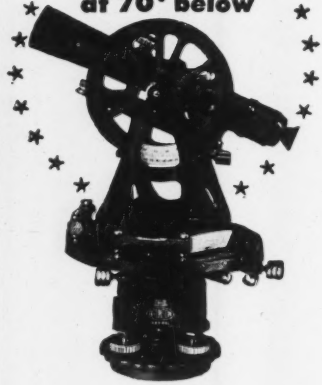

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Alta., Medicine Hat—Bd. Educ., Medicine Hat, school, **$400,000.** CD 3/24/44—ENR 4/6/44.

B. C., Gibson Landing—Trustees School Dist. 46, Sechelt, plans by H. Cullerne, 325 Howe St., Vancouver, high school, **$360,800.**

●**B. C., Jones Lake (Postal Dist. Chilliwack)**—British Columbia Electric Co. Ltd., 918 Government St., Victoria hydro-plant exten, **$7,000,000.**

B. C., Sechelt — Trustees of School Dist. 46, Attie Burns, secy., Sechalt, plans by H. Cullerne, 325 Howe St., Vancouver, Gibson Landing High School, **$360,800,** 2 schools, school addn., **$204,500.**

Ont., Cooksville—South Peel High School Bd., Port Credit, high school, **$378,000.**

●**Ont., Toronto** — City, H. E. McCallum, mayor, City Hall, 3 homes for aged chronically ill. Approx. **$2,400,000.** K. S. Gillies, c/o owner, engr. CD 8/30/45—ENR 9/6/45.

Que., Farnham — Central Mortgage & Housing Corp., 70 Lyon St., Ottawa, Ont., 50 houses, **$400,000.** J. J. O'Sullivan, 1253 McGill College Ave., Montreal, engr.

●**Que., Hull**—Central Mortgage & Housing Corp., Ottawa, Ont., 300 houses, Benedict Farm, Aylmer Rd. Approx. **$2,000,000.**

COMMERCIAL BUILDINGS

●**Ala., Birmingham**—Hamilton Perkins, c/o Long & Gatling, Frank Nelson Bldg., 100 apartment units, **$1,000,000.**

Ala., Birmingham — Nelson Weaver, c/o Horace Weaver, archt., Swann Bldg., Birmingham, 100 apartment units. Approx. **$500,000.**

Ark., Arkadelphia—Ouachita College, Arkadelphia, plans by Wittenberg, Delony & Davidson, Pyramid Bldg., Little Rock, main bldg., **$300,000;** science hall, **$325,000;** library, **$100,000.** CD 3/5/46—ENR 3/14/46.

Ark., Camden—First Baptist Church, Camden, plns by McAninch & Mahnker, Exchange Bldg., Little Rock, church auditorium, **$250,000.**

Calif., Belmont — College of Notre Dame, Ralston Blvd., Belmont, auditorium, **$250,000.**

Calif., Fairfield—C. M. Allen, 1003 Washington St., 74 residences on 12-acre site adjoining Waterman Park. Approx. **$300,000.**

Calif., Los Angeles—Western Waxed Paper Co., Div. of Crown Zellerbach Corp., 910 E. 61 St., plans by The Austin Co., 777 E. Washington Blvd., 90x100 ft., frame, stucco office; 400x450 ft. factory, incl. tank farm, utilities, boiler plant, railroad siding, etc., **$550,000.**

Conn., Middletown—Middletown Hotel Corp., Phelps Ingersoll, chn., Bldg. Comm., plans by Guy Francis Lamb, 252 Main St., Middletown and Hart-Jerman Assoc., 247 Park Ave., New York, N. Y., 3 story, brick, steel hotel, Washington St., **$500,000.** Bids 7/20/48 rejected. CD 7/13/48—ENR 7/15/48.

Conn., New Haven — Hopkins Grammar School, 986 Forest Rd., plans by Douglas Orr, 96 Grove St., brick, steel school. **$690,000.** CD 2/5/47—ENR 2/13/47.

Conn., West Hartford—Thomas R. Smith, West Point Terrace, 35 frame ranch type homes, **$350,000.**

Del., Wilmington—Delaware Power & Light Co., 6 and Market Sts., plans by G. Morris Whiteside, 11 du Pont Bldg., office and service bldg. **$700,000.** United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., consult. engr. CD 1/1—ENR 2/3.

Fla., Miami—Owner, c/o Edward H. Baxter & Vernon D. Lamp, archts., 207 Alcazar Ave., Coral Gables, 44 homes. Approx. **$250,000.**

Fla., Miami Beach—Professional Plaza, c/o Henry Hohauser & Assoc., Miami Beach, office, approx. **$250,000.**

Fla., North Miami—W. F. Chatles, c/o Harry E. Penney, archt., 3133 Coral Way, Miami, 100 homes. Approx. **$500,000.**

Ga., Atlanta—Biltmore Hotel, W. Peachtree St., hotel addn., Approx. **$250,000.**

Ga., Atlanta—The Massell Companies, 32 Pryor St. N. E., hotel. Approx. **$250,000.**

Ga., Brunswick—Sea Island Holding Co., c/o Abreu & Robeson, archts., Brunswick, beach club, **$300,000.**

Ill., Arlington Heights—St. Peters Evangelical Lutheran Church, Arlington Heights, plans by Charles Klopp, 34 N. Broadway, Palatine, 2 and 3 story, 60x110 ft. steel, brick church. **$250,000.**

Ill., Chicago—American School of Baking, 1135 W. Fullerton St., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., brick, steel, concrete baking school, **$500,000.**

●**Ill., Chicago**—Isadore Brown, 11 S. LaSalle St., plans by Leo S. Hirschfeld, 120 S. LaSalle St., 16 story, steel, brick, stone apartment and garage, Astor and Bank Sts. **$1,750,000.**

●**Ill., Chicago** — Community Development Trust, c/o Holsman, Holsman, Klekamp & Taylor, archts., 39 S. State St., eleven 8 story and twenty-four 3 story brick, steel apartments, 63 and S. Park Ave. **$6,500,000.**

Ill., Chicago—Congregation Rodef Zedek, 1022 E. 54 Pl., plans by Eugene & Max Fuhrer, 120 S. LaSalle St., and A. Epstein & Sons, 2011 W. Pershing Rd., 2 story, bsmnt., steel, brick community bldg. **$300,000.** CD 2/14/46—ENR 2/21/46.

●**Ill., Chicago**—Sinai Congregation, 5252 S. Hyde Park Ave., plans by Friedman Alschuler & Sincere, 223 W. Jackson, Sinai Temple, 45 and Lake Michigan Sts. **$2,250,000.**

Ill., Glencoe—Temple Beth-El, 786 Greenleaf St., plans by Sidney Morris & Assoc., 134 N. La Salle St., Chicago, synagogue on 7 acre estate. **$600,000.**

Ill., Skokie—Williamsburg Village Sudivision, Greenwood Rd., Skokie, plans by Irving A. Blietz, 8905 E. Prairie St., Housing Williamsburg division. **$900,000.**

Ill., South Holland—First Reformed Church, 157 and State Sts., plans by Herbert A. Brand, 400 W. Madison St., Chicago, 1 story, bsmnt., steel, stone church. **$300,000.**

Ind., East Chicago—Pulaski Post 18 American Legion, 3807 Pulaski St., 2 story, bsmnt. 75x112 ft., brick, stone, rein.-con. steel club house. **$250,000.** J. Rakowski, 3704 Main St., consult. engr.

Ind., Fort Wayne—Missionary Assoc., c/o LeRoy Bradley, archt., 1115 S. Clinton St., 2 story, bsmnt., L shaped, rein.-con., steel, stone office, Rudisill Blvd. **$250,000.**

Ia., Des Moines—David R. Nieman, 500 Block E. Main St., 132x264 ft. food market, **$250,000.**

Ia., Des Moines—Younkers of Des Moines, E. Washington St., department store. **$300,000.**

Ia., Iowa City—Younkers Inc., Joseph F. Rosenfeld, chn. Bd., 7 and Walton Sts., Des Moines, 3 story, bsmnt., brick, concrete, steel department store, E. Washington St. **$300,000.**

Kan., Topeka—Santa Fe Hospital Bd., Topeka, plans by Cooper & Robinson, Commerce Bldg., Kansas City, Mo., hospital addn. **$500,000.**

Kan., Topeka—Stormont Hospital, 334 Greenwood St., plans by J. A. Hamilton & Assoc., 520 S. E. Essex St., Minneapolis, Minn., hospital. **$275,000.** CD 2/20/46—ENR 2/28/46.

Ky., Louisville—Bank of Louisville, 427 W. Market St., branch bank, 624, 626 and 628 W. Broadway.

Md., Kensington—Kensington Gardens, Inc., c/o Morrison Bros., Bank of Bethesda Bldg., Bethesda, 52 unit, 4 story, brick, concrete block, concrete apartments Connecticut Ave., Nimitz St. Frank B. Proctor & Ted Engelhardt, 8616 Georgia Ave., Silver Springs, archt.

● Mass., Boston—Jordan Marsh Co., 450 Washington St., plans by Perry Shaw Hepburn, 955 Park Sq. Bldg., 7 story, bsmnt., brick store Unit 2, Washington Summer, Chauncey and Avon Sts. Approx **$1,000,000.** M. A. Reidy, 101 Tremont St., Boston, structural engr.

● Mass., Dorchester—Carney Hospital, Old Harbor St., South Boston, plans by Maginnis & Walsh, 125 Newbury St., Boston, 8 story general hospital, Dorchester Ave. **$1,000,000.**

Mass., Melrose Highlands (b. Boston)—Melrose Congregational Church, Melrose Highlands, plans by Arland A. Dirlam, 673 Boylston St., Boston, church. **$300,000.**

Minn., Duluth—Helenic Orthodox Community Church, plans by Peter E. Camburas, 105 W. Madison St., Chicago, Ill., and Thos. J. Schedlbick, 309 W. Superior St., church. **$600,000.**

Minn., Minneapolis—M. W. Pierce, c/o P. E. Crosier & Son, archt., 2441 Lyndale Ave. S., two 2 story, bsmnt., 55x100 ft. brick apartments, 43 St. and Upton Ave. S. **$300,000.**

Minn., St. Paul—Riverview Memorial Hospital, 255 Prescott St., plans by Ellerbe & Co., 505 First National Bank Bldg., 3 story hospital addn., alterations. **$250,000.** CD 3/17—ENR 3/31.

Miss., Natchez—International Paper Co., c/o Harlan Shope, engr., Natchez, 250 housing units. Approx. **$250,000.**

● Mo., St. Louis—St. Louis Childrens Hospital, Mrs. Harry Langenberg, pres. Bd. Mgrs., 500 S. Kingshighway, Zone 10, plans by Mauran, Russell, Crowell & Mullgardt, 620 Chemical Bldg., 721 Olive St., Zone 1, brick, concrete, steel, stone hospital alterations, addns., incl. 1 and 2 story tower, 4 to 6 story wing. Approx. **$2,000,000.** CD 6/3.

Neb., Lincoln—Westminster Presbyterian Church, 2110 Sheridan St., chapel. **$275,000.**

N. Y., Brooklyn—Meyer Glick, 4126 Kings Highway, Zone 10, plans by Morris Rothstein & Son, 186 Joralemon St., Zone 1, 6 story apartment 9325-29 Kings Hy. **$925,000.**

N. Y., Brooklyn—Sam J. Lefrak, 97-50 Queens Blvd., Rego Park, plans by Julius Fishkind, 185W E. 31st St., Zone 10, 6 story apartment, 3502-32 Kings Hy. **$650,000.**

N. Y., Jamaica—Hillcrest Jewish Center, Inc., 86-15 Kent St., plans by Glabetson & Klein, 14 E. 38 St., New York, Zone 16, synagogue and community center, Union Turnpike near Kent St. **$100,000.**

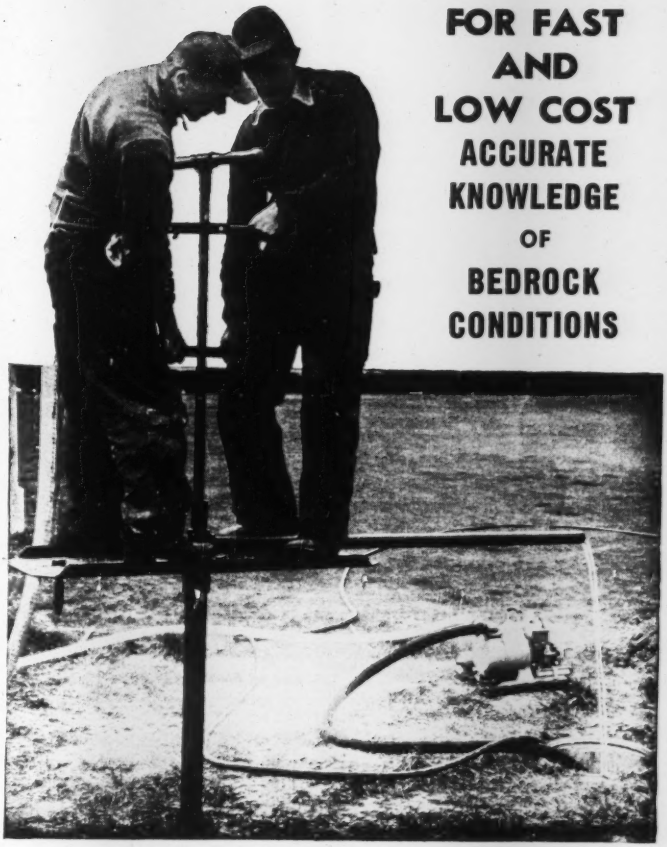
N. Y., New York—Jobreen Realty Corp., 1169 E. 156 St., Zone 59, plans by Charles E. Greenberg, 565 5 Ave., New York, Zone 17, apartment, 189-99 W. Houston St. **$750,000.** CD 9/13/44—ENR 9/21/44.

● N. Y., Rego Park—Ferman Builders, Inc., c/o S. J. Kessler & Sons, archt., 118 E. 28 St., New York, Zone 16, apartment, Woodhaven Blvd. between 62 Dr. and 64 Rd. **$1,000,000.**

N. C., Raleigh—Hunter Park Homes, Inc., Charles H. Douglas, Capital Club Bldg., 133 houses, Negro Housing, 1018 E. Davie St. **$800,000.**

O., Canton—McKinley Avenue Temple, H. A. Greenberg, vice pres., 1,000 seat Jewish Temple, Harvard Ave. and 25 St., N. W. **$300,000.**

O., Cleveland—St. Johns Hospital, 7911 Detroit Ave., plans by Dalton & Dalton & Assoc.,



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979 Arcade Bldg., 4 story, bsmnt., 50 bed brick hospital addn., and boiler house, **$500,000.**

Okla., Tulsa—Farmers & Merchants Bank, 1114 S. Harvard St., plans by Wm. Wolover, 1423 S. Boston St., bank. **$300,000.**

Pa., Phila.—Rebekah Home, 248 E. Girard Ave., home. **$250,000.**

Pa., Pittsburgh—Westbrook Real Estate Co., 5804 Center Ave., plans by Phillip Friedman, 121 S. Negley Ave., forty-eight suite 6 story, bsmnt., brick, block apartment, Ellsworth and Negley Sts. **$425,000.**

R. I., Providence—Wayland Realty Co., 225 Waterman St., Providence, plans by Samuel Lerner Assoc., 1214 Union Trust Bldg., 2 story bsmnt., 45x75 ft., brick medical bldg.

Tenn., Nashville—Bd. Educ. of Methodist Church, 810 Broadway, 2 story, 25,000 sq. ft. office, **$400,000.**

●**Tenn., Nashville** — Cain-Sloan Co., Church St., department store. **$1,000,000.** CD 2/8/46 —ENR 2/21/46.

Tenn., Nashville—First Federal Savings & Loan Assn., 306 3 Ave. N., plans by Donald Southgate, Nash Triangle Bldg., 3 story office. **$300,000.**

●**Tenn., Nashville**—Nashville Electric Service, 505 Church St., brick, concrete steel office bldg. and service center. **$3,000,000.** Stone & Webster, 49 Federal St., Boston, Mass., engrs. CD 6/18/48—ENR 7/8/48.

Tex., Brownsville—Mercy Hospital, c/o Mrs. L. F. Lightner, Brownsville, plans by Page, Southerland & Page, 602 West Ave., Austin, 42 bed hospital unit. **$400,000.** Wilson & Cottingham, Littlefield Bldg., Austin, structural engrs. Lindauer & Guerrero, 4801 Lemmon St., Dallas, mechanical engrs. CD 3/30—ENR 4/21.

●**Tex., Corpus Christi**—Corpus Christi, Inc., Lee Aiken, pres., Airport Rd., 100 frame, masonry residences, 22 acre tract off S. Staples St. **$1,500,000.**

Tex., Dallas—Avery Mays Co., 7917 Preston Park Dr., 45 dwellings, concrete slab fdn., Deerpath Village. **$300,000.**

Tex., Dallas — East Dallas Presbyterian Church, 4420 Swiss St., plans by James A. Russell & G. Mallory, c/o owner, church, 9 acre plot, Bob-O-Link Dr. **$400,000.** CD 3/23—ENR 4/7.

Tex., Dallas—Southern Methodist University, Mockingbird Lane, plans by Mark Lemmon, Tower Petroleum Bldg., bldg. for Perkins school of Theology. **$250,000.** CD 5/7/45—ENR 5/17/45.

Tex., Fort Worth—Ridglea Housing Corp., 6300 Camp Bowie Blvd., plans by Jim D. Vowell, Electric Bldg., 73 frame dwellings, concrete slab fdn., Ridglea West Addn. **$125,000.**

Tex., Houston—S. N. Adams, 4601 Westheimer Rd., plans by Cowell & Newhouse, Jr., 2305 LaBranch, masonry, concrete community center, Highland Village **$650,000.**

Tex., Houston—Leo J. Duplantis, 219 Garner St., 34 one story frame dwellings, concrete slab fdn., Rossonian Courts. **$250,000.**

Tex., Houston—Frank J. Gaskey, 4221 Coleridge St., 9 one and two story brick, cedar shade dwellings, Sect 1, Southern Oaks Addn., Glenhaven Blvd. **$300,000.**

Tex., Houston—Frank J. Gaskey, 4221 Coleridge St., 12 masonry dwellings, concrete slab fdn., 3100 block Bellfontaine St. **$250,000.**

Tex., Houston—Kelly & Kelly, 4120 Graustark St., 20 dwellings, 3100 block Bluebonnet, **$100,000.**

●**Tex., Houston**—Plantation Development Co., c/o L. L. Ray, Homes and Chocolate Bayou Rds., 300 dwellings, portion of South Park sub-division. **$1,800,000.**

Tex., Orange—St. Marys Parish Church, Orange, plans by Beck & Beck,, Orange, masonry church. **$250,000.**

Tex., Prairie View — Prairie View College, Prairie View, plans by Carlton Adams, A. & M. Sys. Archt., College Station, girls dormitory. **$325,000.** CD 5/24/46—ENR 5/30/46.

●**Tex., San Antonio**—V. F. Buchek Co., Major Bldg., San Antonio, plans by Shoop & Roberts, Olmos Dr., shopping center, Bandera Rd., **$1,-750,000;** addtl. shopping unit, west side of Bandra R., south of Woodlawn. **$250,000.**

Tex., San Antonio—H. E. Butt Grocery Co., Robstown Rd., Corpus Christi, plans by Phelps & De Wees & Simmons, 1501-6 Majestic Bldg., masonry supermarket, concrete slab fdn., 400 ft. on Bandera Rd **$250,000.**

●**Tex., San Antonio**—P. M. Chamberlain & Assoc., Jacksonville, plans by George Willis, Transit Tower, 400 room resort hotel, 10 mi. out Fredericksburg Rd. opposite Camp Bullis. Approx. **$5,000,000.** Harold Barthelemew & Assoc., 317 N. 11 St., St. Louis, Mo., consult. engrs.

Tex., San Antonio—Delavan Realty Co., c/o G. W. Delavan, Sr., 3302 W. Woodlawn St., plans by Roy Baines, c/o owner, 100 dwellings, off Oblate Dr. **$600,000.**

Tex., San Antonio—W. K. Ewing Co., Alamo Natl. Bldg., plans by N. Straus Nayfach Assoc., Alamo Natl. Bldg., community center, **$850,000.** Edward Tanner, 316 Ward Parkway, Kansas City, Mo., consult. archt. R. Andrieks, Milam Bldg., San Antonio, engr. grade work.

Tex., Vernon—W. T. Waggoner Estates, c/o R. B. Anderson, mgr., Vernon, plans by Wilson & Patterson, 209 Majestic Bldg., Fort Worth, 1 and 2 story, structural steel, face

brick office bldg., garage and warehouse. **$500,000.**

Vt., Randolph — Gifford Memorial Hospital, Inc., Randolph, plans by Kendall Taylor & Co., Inc., 221 Columbus Ave., Boston, Mass., 2 story, brick, two wings nurses home and hospital wing. **$500,000.**

Wash., Tacoma — Young Mens Christian Assn., S. 17 and Market Sts., plans by Lea, Pearson & Richards, Tacoma Bldg., new building with swimming pool and gymnasium and modernizing present bldg. **$250,000.** CD 4/11/46—ENR 4/25/46.

Wash., Seattle—Temple de Hirsch, 15 and E. Pike Sts., church. **$750,000.**

Wis., Milwaukee—Concordia College, 3126 W. Kilbourn Ave., Zone 8, plans by E. A. Stubenrauch, 708 Erie Ave., Sheboygan, 2 story, part bsmnt., administration-music auditorium, swimming pool bldg. **$250,000.**

●**Wis., Milwaukee**—Kurtes R. Froedert, 3830 W. Grant St., Zone 4, plans by Grassold & Johnson, 734 N. Jefferson St., Zone 2, shopping center, S. 27 St. between W. Morgan and W. Ohio Avenues. **$2,000,000.**

Alaska, Juneau — Everett Nowell, 7356 18 Ave. N. E., Seattle, Wash., 100 housing units of 4 apartments each. **$800,000.**

Alta., Edmonton—Owner, c/o Trudeau Corp., Lemongrove Calif., U. S. A., office bldg., 104 St. and 82 Ave. **$300,000.**

Ont., Sarnia—Principal Investments, Ltd., 67 Richmond St. W., Toronto, stores. Approx. **$500,000.**

Ont., Toronto — H. Davidson, 331 Bay St., plans by Kaplan & Sprachman, 305 W. Dundas St., 5 story, 60x114 ft., concrete, brick office. **$250,000.** W. S. Hall, 53 Gerrard St., engr.

Que., Hull—Roman Catholic School Bd., Hull, school. **$250,000.**

Que., Quebec City—Parish of St. Vincent de Paul, Rev. G. Pontbriand, cure, 62 Cote d'Abraham, church and convent. Approx. **$450,000.**

Que., Rouyn—A. O. Vailloncourt, 117 Principale St., 50 houses, Rouyn South. Approx. **$250,000.**

INDUSTRIAL BUILDINGS

Calif., Colusa — STORAGE and TRUCK DISTRIBUTION CENTER — Union Oil Co., 425 First St., San Francisco, storage and truck distribution center. **$100,000.**

Calif., Oxnard — FACTORY, etc. — Allis-Chalmers Mfg. Co., E. E. Houston, mgr., 558 S. B St., factory, office and mfg. bldg. addns., 40,000 sq. ft. foundry and engineering bldg. **$250,000.**

●**Calif., Richmond**—MARINE TERMINAL—Texas Co., 929 Broadway, Los Angeles, marine terminal, incl. warehouse, office, wharf, etc. **$3,000,000.**

Del., Seaford—PLANT—E. I. du Pont de Nemours & Co., Inc., Nemours Bldg., Wilmington, nylon mfg. plant expansion. Approx. **$250,000.** H. M. Gordon, c/o owners, constr. div., engr.

Ga., Atlanta—WAREHOUSE, etc.—Massey-Harris Co., 1721 Packard Ave., Racine, Wis., warehouse and office. Approx. **$100,000.**

Idaho, Pocatello—PLANT—Butler Mfg. Co., 7400 E. 13 St., Kansas City, Mo., plant. **$100,000.**

●**Ill., Bedford Park**—BOILER PLANT—Corn Products Refining Co., Bedford Park, 100x125 ft., steel, rein.-con. boiler plant **$3,000,000.** Sargent & Lundy, 140 S. Dearborn St., Chicago, engrs.

Ill., Blue Island — FACTORY — Gary Steel Supply Co., 2300 S. Springfield St., Chicago, 1 story, 53,000 sq. ft. floor space, steel, brick factory. **$270,000.** Abell-Howe Co., 53 W. Jackson Blvd., Chicago, consult. engr.

●**Ill., Plainfield** — GAS STORAGE DEPOT — Peoples Gas Light & Coke Co., 122 S. Michigan St., Chicago, liquefying and storage depot for natural gases. **$6,000,000.** Chicago District Pipe Line Co., 122 S. Michigan Ave., engr.

Ind., Goshen—FACTORY—Goshen Mfg. Co., E. Reynolds St., plans by Hubert Miller, 120½ S. Main St., 2 story, 100x173 ft. brick factory. **$140,000.**

Ind., Hammond — PLANT — S. G. Taylor Chain Co., 2-141 St., plans by Bachman & Bertram, 5116 Hohman St., plant.

Ia., Sanborn—GRAIN ELEVATORS—Farmers Co-operative, Sanborn, concrete grain elevator. **$125,000.**

Kan., Arkansas City—PASSENGER STATION—Atchison, Topeka & Santa Fe R. R. Co., T. A. Blair, ch. engr., 80 E. Jackson Blvd., Chicago, 4, Ill., passenger station. **$362,000.**

Ky., Louisville—SALES and SERVICE—Koster-Swope Buick, Inc., c/o Joseph H. Kolbrook, Starks Bldg., auto sales and service bldg. **$200,000.**

Md., Hurlock—FACTORY—Louis & Oscar Bogash, Hurlock, rebuilding factory. **$125,000.**

Md., Salisbury—GARAGE, etc.—I. V. Theis, Salisbury, rebuilding garage and commercial bldg. **$225,000.**

Mass., Woburn—WAREHOUSE—United Motors Service, Div. General Motors Corp., 3044 W. Grand Blvd., Detroit, Mich., plans by Argonault Realty Div., General Motors Corp., 3044 W. Grand Blvd., Detroit, Mich., 1 story, brick, steel, concrete warehouse and office, Cross St. **$150,000.**

ASSEMBLY LINE ERECTION of eighteen large sludge digestion tanks speeds construction at the Los Angeles sewage plant

Hyperion Digesters Are Mass-Produced

"Mass production" of the 18 sludge digestion tanks for the Los Angeles sewage treatment plant has been made possible by use of steel forms permitting efficient concrete placing and because the design included a wire-wrapped prestressing system. This prestressing permits the 33-ft side walls of the 111-ft. dia. digesters to be cast in quarter-sections with vertical joints. The tanks will have conical bottoms and domed roofs.

The $3,991,000 contract—held by the Pacific Bridge Co.—for construction of the digester system at Hyperion is only one of several contracts now under way on the new 245-mgd activated-sludge plant (ENR May 29, 1947, vol. p. 874). Other work in progress on the plant—intended to remedy the pollution of 10 miles of beaches—includes a mile-long, 12-ft dia. outfall (ENR Aug. 5, 1948, p. 64), a headworks building, a filter and dryer building, primary settling tanks, a power and blower building, and the moving of 14,000,000 cu.yd of sand from the plant site.

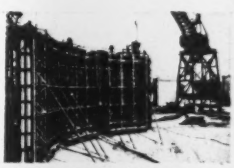
Two alternates were allowed for the tank walls when bids were called: tanks of conventional reinforced concrete design, or tanks built by the wire-wrapped prestressing [illegible]. For each alternate, the [illegible] items were [illegible] ers, flat [illegible] accepted.

[illegible] are [illegible] be [illegible] pe [illegible] of [illegible]

for easier construct[illegible] and more effective heat insulation.

Wrapping wire [illegible] is initially 0.162 in. dia. During the wrapping the wire is drawn down to a diameter of about 0.142 in. The prestressing increases the length of [illegible]0-lb., 3,700-ft wire bundle to 6,[illegible].

In this manner a [illegible] of 130,000 to 150,000 psi. [illegible] into the wire. [illegible]



THREE SECTIONS of steel forms are used for one-quarter of the inside of a digester wall. Casting tanks in four parts is permissible because of wire wrapping.

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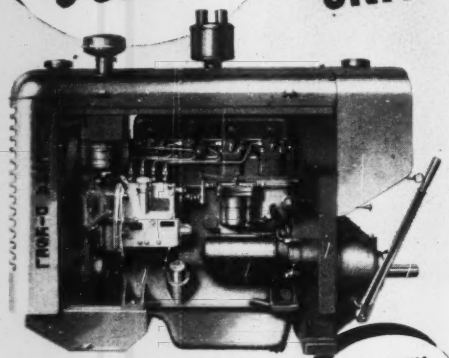

BULLETIN NO. 1410

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Minn., St. Paul — WAREHOUSE — Cities Service Oil Co., 500 Robert St., plans by M. & G. Buetow, 1931 University Ave., 1 story, 167x260 ft., concrete warehouse, Fairview and Thomas Aves. **$100,000.** CD 4/28—ENR 5/26.

Minn., St. Paul—FACTORY—Minnesota Mining & Mfg. Co., 800 Fauquier Ave., 2 story, 145x565 ft., steel, masonry factory, Reaney Ave. between Arcade and Mandota Sts. Approx. **$500,000.**

Miss., Cleveland—PLANT—Baxter Laboratories, Inc., Morton Grove, Ill., mfg. plant, **$500,000.**

● **Neb., Bellevue** — POWER PLANT — Loup River Pub. Power Dist., Columbus, power plant, **$3,000,000.** P. E. Haupton, c/o owner, engr.

Nev., Reno — BUS DEPOT — Pacific Greyhound Lines, Pine and Battery Sts., San Francisco, Calif., plans by E. Keith Lockard, 232 W. 1 St., 2 story, 16,000 sq. ft. concrete, steel bus depot, **$175,000**; 14,000 sq. ft., rein.-con., steel bus loading platform, **$100,000.** Keller & Gannon, 126 Post St., San Francisco, Calif., consult. engr. CD 5/12/48—ENR 5/27/48.

N. Y., Brooklyn—SHOP, etc.—General Linen Supply & Laundry Co., 553 Marcy Ave., Zone 6, plans by Michael Marlo, 200 Beverley Rd., Zone 18, 3 story shop and garage alterations, 104-06 Stockton St. **$100,000.**

N. Y., Brooklyn—PLANT—Industrial Lithographic Co., Inc., 285 Madison Ave., New York, Zone 17, plans by Freed & Gordon, 624 Madison Ave., New York, Zone 22, 2 story printing plant, 6304-24 8 Ave. **$400,000.**

N. Y., Woodside — GARAGE — Waddington Milk Co., 102 W. 24 St., New York, Zone 11, plans by W. H. Fuhrer, 503 Fifth Ave., New York, Zone 17, garage, milk depot, 58 St. and 56 Dr. **$110,600.**

O., Akron—WHOLESALE, etc.—Shell Petroleum Corp., 2000 W. 25 St., Cleveland, 1 story, 90x160 ft. brick, wholesale and garage bldg., 77x70 ft. office, driveways, parking area. **$200,000.**

●**O., Ashtabula**—FACTORY—Hooker-Dextrex, Inc., Niagara Falls, N. Y., factory making trichloroethylene, on 25 acre site on State Rd. **$1,500,000.**

O., Cleveland — PLANT, etc. — Tennerman Products, Inc., 2038 Fulton Rd., plans by Earnest McGeorge and Hargett & Assoc., 7016 Euclid Ave., 1 story, brick, cement block, steel, mfg. plant boiler house and office, concrete fdn.

●**O., Euclid**—STORAGE, etc.—Lincoln Electric Co., 12818 Court Rd., plans by Austin Co., 16112 Euclid Ave., Cleveland, 1 and 2 story brick, steel, concrete storage and administration facilities. **$9,000,000.**

●**O., Stratton**—POWER PLANT—Ohio Edison Co., 47 N. Main St., Akron, power plant on 75 acre site. Several Million Dollars.

Okla., Alva—GRAIN ELEVATOR—Farmers Union Co-operative, Alva., 500,000 bu. grain elevator. **$125,000.**

●**Okla., Elk City** — POWER PLANT — Public Service Co., 600 S. Main St., Tulsa, 6,000 kw. gas turbo-generator power plant. **$1,000,000.**

Okla., Hobart—GRAIN ELEVATOR—Farmers Union Co-operative, Hobart, 250,000 bu. grain elevator. **$100,000.** Homer & Wyatt, Dwight Bldg., Kansas City, Mo., consult. engrs.

Pa., Phila.—WAREHOUSE—Abbotts Dairies, Inc., 56 and Arch Sts., rebuilding warehouse. **$100,000.**

Pa., Saegerstown—PLANT—General American Transportation Co., Sharon, tank car repair plant and waste plant to treat fluids used in cleaning tank cars.

●**Pa., West Point**—RESEARCH LABORATORY—Sharp & Dohme, Inc., Broad and Wallace Sts., Phila., medical research laboratory. **$1,000,000.** CD 4/26—ENR 5/19.

Tex., Freeport—PLANT—Dow Chemical Co., Freeport, rehabilitation magnesium plant. **$212,000.**

●**Tex., Houston**—GARAGE—Houston Club, c/o J. S. Abercrombie, Commerce Bldg., 8 story, basmt. masonry 400 auto capacity storage garage, McKinney St. **$2,250,000.**

●**Tex., Longview**—PLANT—Eastman Kodak Co., 343 State St., Rochester, N. Y., plant. **$1,000,000.**

●**Tex., Orange**—STEEL MILL—Consolidated Steel Corp., Orange, expansion, remodeling wartime Navy Shipyard into steel mill plant. **$1,500,000.**

Tex., Refugio—PLANT—Bennett Oil & Refining Co., Refugio, reconstructing topping plant. **$100,000.**

Tex., Vernon—WAREHOUSE, etc.—W. T. Waggoner Estate, c/o R. B. Anderson, mgr., Vernon, plans by Wilson & Patterson, Major Bldg., Ft. Worth, 2 story, 260x240 ft., reinf.-con., brick, stone warehouse and office. **$500,000.**

W. Va., Hastings—PLANT—Carbide & Carbon Chemical Co., 30 E. 42 St., New York, N. Y., three 1 story chemical plant bldg. addns. **$250,000.** Ford, Bacon & Davis, 39 Broadway, New York, N. Y., consult. engrs.

Wis., Chippewa Falls — WAREHOUSE — Leinenkugel Brewing Co., Chippewa Falls, plans by E. F. Klinger & Assoc., 218 S. Barstow St., archts. and consult. engrs., Eau Claire, 1 story, 70x150 ft., steel, brick, blocks warehouse addn., concrete fdn.

Wis., Madison—STORAGE—Royster Guano Co., Dempsey Rd., 1 story, 100x240 ft., steel, brick storage bldg. addn., concrete fdn., 150x500 ft. loading platform. **$200,000.**

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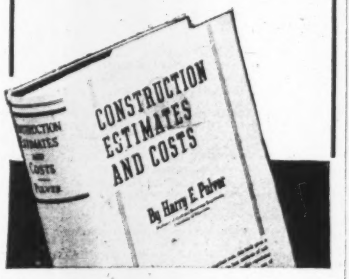

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Alta., Calgary—PLANT—Gypsum Lime & Alabastine, Canada, Ltd., 30 Ave. and 17 St. E., rock wool insulated plant. Approx. **$300,000.**

Alta., Edmonton—WAREHOUSE—Canadian Oils Ltd., Terminal Warehouse Bldg., Toronto Ont., warehouse, 105 Ave. **$100,000.**

Man., Winnipeg—FACTORY—Gypsum Lime & Alabastine Canada Ltd., Sargant and St. James Sts., factory addn. Approx. **$500,000.**

Ont., Brantford—FACTORY—Ruddy - Freehorn Co., 69 Elgin St., refrigeration equip. factory. **$100,000.**

Ont., Cornwall—WAREHOUSE, etc.—Brewers Warehouse Co. Ltd., 19 Richmond St., Toronto, brick, steel warehouse, two wings, 65x175 and 32x80 ft., and garage. Approx. **$180,000.** M. M. Dillon & Co., Bank of Toronto Bldg., Toronto, engrs.

Ont., Cornwall—PLANT—Canada Dry Ginger Ale Ltd., 153 Sherbourne St., Toronto, plant. Approx. **$125,000.**

Ont., Islington—FACTORY—Coleman Lamp & Stove Co. Ltd., 9 Davies Ave., Toronto, 1 story, concrete, brick, steel factory. **$100,000.**

Ont., Leaside—(POSTAL DIST., TORONTO) —PLANT—Panther Oil & Grease Ltd., 840 N. Main St., Fort Worth, Tex., U.S.A., plant mfg. asbestos and asphaltic roofing compounds. **$100,000.**

Ont., Toronto — PLANT — Parkdale Wines Ltd., 183 Bathurst St., plant, Queen Elizabeth Way at Alan Ave., Etobicoke. Approx. **$125,000.** H. B. Kahl, 26 Queen St. E., archt.

Ont., Welland — WAREHOUSE — Brewers Warehouse Co. Ltd., 19 Richmond St., Toronto, 1 story, part bsmnt., 70x200 ft., brick, steel, concrete brewers warehouse. Approx. **$175,000.** M. M. Dillon & Co., Bank of Toronto Bldg., Toronto, engrs.

●**Que., Montreal** — PLANT — Canadian Oil Companies, Ltd., 204 Richmond St. W., Toronto, Ont., lubricating oil blending plant and grease mfg. plant, at Terminal Plant, Notre Dame St. E. Approx. **$1,500,000.** R. T. Eyre, c/o owner, engr.

Que., Montreal — FACTORY — J. A. Julien, 2735 E. Notre Dame St., 69x114 ft. concrete, brick, steel factory. **$100,000.** C. Grenier, 170 Geneva Crescent, Mount Royal, archt. H. Jason, 1410 Guy St., engr.

Que., Quebec City—PLANT—Chronicle-Telegraph Co. Ltd., Blade St., newspaper plant and printery. **$250,000.**

Que., Quebec City — TANNERY — Winwick Street Tannery Ltd., Warrington-Lancashire, England, tannery.

Que., Quebec City—PLANT—European Syndicate, c/o Industrial Comr., City Hall, remodeling bldg. for tannery, Marie de L'Incarnation St. in St. Saureur Ward. **$100,000.**

Que., Quebec City—PLANT, etc.—Germain Lepine, Ltd., 282 St. Vallier St., 3 story, 160x138 ft., 40x138 ft., and 40x190 ft. plant and office. Approx. **$250,000.**

UNCLASSIFIED

Ark., Little Rock — COLISEUM — Arkansas Livestock Show Assn., Pyramid Bldg., plans by Erhart, Eichenbaum & Rauch, Wallace Bldg., coliseum. **$500,000.**

Calif., Ashland — BOWLING RINK—Bay Cities Recreation Co., 880 Bay View, Port Chicago, bowling rink. **$250,000.**

Calif., Los Angeles — TERMINAL, etc. — City Harbor Comn., City Hall, pasenger and cargo terminal, West Basin, **$5,800,000;** apron wharf and transit sheds at Berths 153, 154, 155, **$2,458,000;** wholesale fish market, Slip No. 1, **$450,000;** incinerator, **$250,000;** new paving **$100,000;** high line facilities at Berth 181, **$100,000;** new fencing and gates **$45,000.** Arthur Eldridge, genl. mgr. CD 11/9/45—ENR 11/29/45.

Calif., Oakland—MOTEL—M. M. Moody, c/o Hillcrest Motel, 2400 MacArthur Blvd., plans by Miller & Warnecke, Financial Center Bldg., motel. **$250,000.**

Calif., Palo Alto — ELECTRICAL UTILITY IMPRVS., etc.—City, City Hall, voted **$600,000** bonds electrical utility imprvs. and **$200,000** bonds gas mains. CD 4/28.

Colorado and Utah — RURAL DISTRIBUTION LINES—Empire Electric Assn., Cortez, 153 mi. rural distr. lines, and sys. imprvs., Dolores and San Miguel Counties, Colorado, and San Juan Co., Utah. **$340,000.** John C. Leavitt, Garden City, Kan., consult. engr.

Illinois — RURAL DISTRIBUTION LINES — Southwestern Electric Co-operative, Greenville, 126 mi. rural distr. lines, 11.4 mi. transmission lines, sys. imprvs., Madison Co. **$970,000.**

Indiana — RURAL DISTRIBUTION LINES — Fulton County Rural Electric Membership Co-operative, Rochester, 25 mi. rural distr. lines, sys. imprvs., Fulton Co. **$195,000.** CD 7/2/45—ENR 7/5/45.

Iowa — RURAL DISTRIBUTION LINES — Sioux Electric Co-operative Assn., Orange City, 49 mi. rural distr. lines, sys. imprvs., Sioux Co. **$210,000.** CD 2/5/47—ENR 2/20/47.

Kansas—RURAL DISTRIBUTION LINES—C. M. S. E. Electric Co-operative, Meade, 279 mi. rural distr. lines, sys. imprvs., Meade Co. and vicinity. **$410,000.** Frank Horton & Co., Lamar, engrs. CD 5/2—ENR 5/26.

Kansas — RURAL DISTRIBUTION LINES — Lane Scott Electric Co-operative, Dighton,

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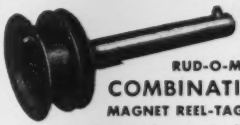

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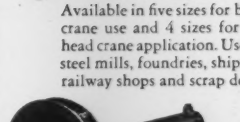

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369 mi. rural distr. lines, sys. imprvs., Lane Co. **$560,000.** CD 11/15/46—ENR 11/28/46.

Kansas—RURAL DISTRIBUTION LINES—Northwest Kansas Electric Co-operative, Bird City, 46 mi. rural distr. lines, sys. imprvs., headquarters facilities, etc., Cheyenne Co. **$200,000.** W. H. Burgwin, Fredonia, consult. engr. CD 10/1/46—ENR 10/17/46.

Louisiana—RURAL DISTRIBUTION LINES — Bossier Rural Electric Membership Corp., Bossier City, 133 mi. rural distr. lines, sys. imprvs., Caddo Co. **$280,000.** Frank Horton & Co., Lamar, Mo., engrs. CD 1/14—ENR 2/3.

Minnesota — RURAL DISTRIBUTION LINES — McLeod Co-operative, Power Assn., Glencoe, 20 mi. rural distr. lines, sys. imprvs., 11 mi. 69KV transmission line and 39 mi. tie lines, headquarters facilities, etc., McLeod Co. **$460,000.** CD 8/23/46—ENR 9/5/46.

Minnesota—RURAL DISTRIBUTION LINES — Wild Rice Electric Co-operative, Mahnomen, 478 mi. rural distr. lines, sys. imprvs., Becker Co. **$745,000.** CD 6/10—ENR 6/17.

● **Mississippi** — RURAL DISTRIBUTION LINES — Southern Pine Electric Power Assn., Taylorsville, 601 mi. rural distr. lines, sys. imprvs., Smith Co. **$1,235,000.** CD 11/24/47—ENR 12/11/47.

Missouri and Iowa—RURAL DISTRIBUTION LINES—Atchison-Holt Electric Co-operative, B. S. Gibbs, mgr., Rockport, 125 mi. single phase rural distr. lines, Atchison, Holt and Nodaway Counties, Mo. and Fremont and Page Counties, Ia., 48 mi. power transmission lines, etc. **$100,000.** Henningson Eng. Co., 626 Standard Oil Bldg., Omaha, Neb., engr.

Missouri — RURAL DISTRIBUTION LINES — Callaway Electric Co-operative, Fulton, 136 mi. rural distr. lines, sys. imprvs., Callaway Co. **$250,000.** CD 8/16/46—ENR 9/5/46.

Missouri—RURAL DISTRIBUTION LINES — New-Mac Electric Co-operative, Neosho, 83 mi. rural distr. lines, sys. imprvs., tie lines, etc., Newton Co. **$650,000.** Frank Horton & Co., Lamar, engrs. CD 5/20—ENR 6/2.

● **Mo., St. Louis**—STADIUM, etc.—St. Louis National Baseball Club, Inc., Fred Saigh, pres., 2623 Dodier St., Zone 7, plans by S. G. Schmidt, Railway Exchange Bldg., 611 Olive St., Zone 1, stadium and field, incl. triple deck grandstand, bleachers, night lighting, flooding facilities, **$1,000,000.** J. Gordon Turnbull, Inc., Railway Exchange Bldg., 611 Olive St., Zone 1, consult. engr.

Montana — RURAL DISTRIBUTION LINES — Lower Yellowstone Rural Electric Assn., Sidney, 29 mi. rural distr. lines, sys. imprvs., headquarters facilities, Richland Co. **$120,000.**

Montana — RURAL DISTRIBUTION LINES — Sheridan Co. Electric Co-operative, Westby, 4.36 mi. rural distr. lines, Sheridan Co. **$650,000.** F. E. Buck, Helena, engr. CD 10/14—ENR 10/28.

● **Nebraska**—RURAL DISTRIBUTION LINES —Nebraska Public Power System, Columbus, rural distr. lines, exten. out into the state from new power plant at Bellevue, **$5,000,000.**

New Hampshire — RURAL DISTRIBUTION LINES — New Hampshire Electric Co-operative, Plymouth, sys. imprvs., completing previously approved constr. and completed construction with prior REA approval, Merrimack Co. **$300,000.**

New Mexico — RURAL DISTRIBUTION LINES — Central New Mexico Electric Co-operative, Corona, acquisition and rehabilitation 38 mi. rural distr. lines in Vaughn, 32 mi. 33 kv. transmission line from Corona to Vaughn, 55 mi. rural distr. line and 375 kw. generating unit at Corona plant and sys. imprvs., Lincoln Co. **$560,000.**

North Carolina — RURAL DISTRIBUTION LINES — Burke-McDowell Electric Membership Corp., Morganton, 190 mi. rural distr. lines, sys. imprvs., 8 mi. new tie line and 2-way radio communication sys., Burke Co. **$460,000.**

N. C., Charlotte—RADIO STATION—WAYS Radio Station, c/o Walter H. Geau, genl. mgr., E. 3 St., 450 ft. AM tower, 525 ft. TV and FM tower, housing for television, 50 acre site off Wilkinson Blvd. **$500,000.**

O., Dayton — PARK, etc. — Dpt. Service & Bldgs., City Hall, Belmont Park, **$85,000;** South Park playground, **$60,000;** Westwood Playfield, **$65,000.** John F. Hale, city engr. CD 11/28/46—ENR 12/13/46.

O., Toledo—PARKING LOT—Tiedtke's Department Store, Summit St., exten. parking lot for 500 addtl. cars, filling in portion waterfront, exten. 160 ft. into river at Adams St. end and 60 ft. Cherry St. end using steel sheet piling, etc., paving with macadam.

Ohio — RURAL DISTRIBUTION LINES — Northwestern Electric Co-operative, Montpelier, 14 mi. rural distr. lines, 17 mi. 34 kv transmission line and sys. imprvs., Williams Co. **$405,000.**

O., Dayton—FIRE DRILL TOWER—Dpt. Safety, City Hall, fire drill tower, **$111,600.** John F. Hale, city engr. CD 11/28/46—ENR 1/2/46, under Dpt. Public Buildings.

Oklahoma—RURAL DISTRIBUTION LINES —Canadian Valley Electric Co-operative, Seminole, 375 mi. rural distr. lines, sys. imprvs., Hughes Co. **$755,000.** CD 3/31/48—ENR 4/15/48.

Oklahoma—RURAL DISTRIBUTION LINES —Kiamichi Electric Co-operative, Wilburton, 451 mi. rural distr. lines, and sys. imprvs., Latimer Co. **$760,000.**

Oklahoma—RURAL DISTRIBUTION LINES —Northwestern Electric Co-operative, Woodward, 516 mi. rural distr. lines, sys. imprvs.,

32½ mi. new tie lines, Woodward Co. $700,000. CD 3/22/48—ENR 4/15/48.

Oklahoma—RURAL DISTRIBUTION LINES—Rural Electric Co-operative, Lindsay, 284 mi. rural distr. lines, sys. imprvs., 7 mi. new tie lines, Garvin Co. **$540,000.**

Oklahoma—RURAL DISTRIBUTION LINES—Cordiaris Valley Electric Co-operative, Collinsville, 397 mi. rural distr. lines, Rogers Co. **$510,000.**

Oregon—RURAL DISTRIBUTION LINES—Benton-Lincoln Electric Co-operative, Corvallis, 84 mi. rural distr. lines and sys. imprvs., Lincoln Co. **$925,000.** CD 7/9/48—ENR 7/22/48.

Pa., Allentown — DRIVE-IN THEATER — Rappaporte Theatres, Mt. Carmel, drive-in theatre. **$100,000.**

●**Pa., Phila.**—MALL—Dpt. Forests & Waters, Education Bldg., Harrisburg, construct mall in three block area north of Independence Hall, as the Phila. State Park. **$3,000,000.**

†**R. I., Newport** — FUEL DISTRIBUTION SYSTEM — Construction Officer, Pub. Wks. Dpt., Naval Training Base, fuel distr. sys., repairs, imprvs., Naval Fuel Annex. **$195,000.**

●†**Tennessee**—POWER LINE—Tennessee Valley Auth., New Sprankle Bldg., Knoxville, 154,000 volt power line from New Johnsonville via Jackson to Memphis. **$2,500,000.**

Texas — RURAL DISTRIBUTION LINES — Floyd Co. Rural Electric Co-operative, Floydada, 86 mi. rural distr. lines, 9.7 mi. 66 kV transmission lines, sys. imprvs., Floyd Co. **$685,000.**

Texas—OIL PIPELINE—Pasotex Pipe Line Co., Box 1249, Houston, 22 mi. 6 in. crude oil pipeline between Snyder Field in Scurry Co. to near Dunn. **$140,000.**

Tex., Beaumont — RECREATIONAL CENTER—Kol Israel Congregation, Beaumont, recreational center. **$125,000.**

†**Tex., Camp Hood (P. O. Killeen)**—BATTALION MOTOR PARK—U. S. Eng., 606 Santa Fe Bldg., Galveston, Battalion Motor Park. **$100,000.**

Tex., Dallas—BROADCASTING STATION—Roy Hofheinz & W. N. Hooper, 4000 Main St., Houston, 10,000 watt radio broadcasting station. **$225,000.**

Tex., Harlingen — RADIO STATION — Roy Hofheinz & W. N. Hooper, 4000 Main St., Houston, 50,000 watt radio broadcasting station. Approx. **$100,000.**

Tex., Houston — TELEVISION STATION — Roy Hofheinz & W. N. Hooper, 4000 Main St., television station. **$235,000.**

Tex., San Antonio—GOLF COURSE, etc.—P. M. Chamberlain & Assoc., Jacksonville, 18 hole golf course, **$150,000**; resort work, incl. road constr., trails, park landscaping, grading, drainage, riding range, **$200,000**; rein.-con. swimming pools, **$175,000**, on 310½ acre plot off Fredericksburg Rd. Harold Bartholomew & Assoc., 317 N. 11 St., St. Louis, Mo., consult. engrs.

Tex., San Antonio—RADIO STATION—Roy Hofheinz & W. N. Hooper, 4000 Main St., Houston, 5000 watt radio broadcasting station. **$100,000**

Tex., San Antonio—ICE SKATING RINK—Sportservice, Inc., c/o Lou Jacobs, c/o Bexar Co. Comrs., Courthouse, ice skating rink plant, incl. large ice plant, at County Coliseum. **$125,000.**

Virginia — RURAL DISTRIBUTION LINES—Mecklenburg Electric Co-operative, Chase City, 151 mi. rural distr. lines, sys. imprvs., and 2-way radio communication facilities, Mecklenburg Co. **$330,000.** CD 7/29/48—ENR 8/26/48.

Washington — RURAL DISTRIBUTION LINES — Nespelem Valley Electric Co-operative, Nespelem, completing previously approved construction and sys. imprvs., Nespelem Co. **$170,000.**

Wyoming—RURAL DISTRIBUTION LINES — Sheridan-Johnson Rural Electrification Assn., Sheridan, 26 mi. 34.5 kv. transmission line, 234 mi rural distr. line, sys. imprvs. and completing previously approved constr., Sheridan Co. **$670,000.**

Alta., Edmonton — GOLF COURSE, etc. — Mayfair, Golf and Country Club, Edmonton, golf course, club imprvs., **$120,000.**

●**Manitoba**—RAIL LINE—Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, Que., rail line, 125 mi. from Sherridon to Lynn Lake. **$2,000,000.**

●**Newfoundland, Bell Island**—ORE MINE FACILITIES—Dominion Steel & Coal Corp., Sydney, N. S., expansion of facilities at Wabana Ore Mines. **$5,000,000.**

Ont., Jackson's Point — SITE DEVELOPMENT—Community Planning Assn. of Canada, Jackson's Point, development Lake Simcoe area, incl. arterial highway to lake and general beautification. **$100,000.**

●**Quebec and Maine**—OIL PIPELINE—Portland Pipeline Corp., Frederick C. Schultz, pres., 335 Forest Ave., Portland, Me., U. S. A., 236 mi. 22-in. crude oil pipeline, Portland, Me., U. S. A., to Montreal, Que. Approx. **$5,000,000.** (**Correction**-owner). CD 5/27.

Quebec — RAILROAD — Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, surveys 50 mi. railroad from Matane to Ste. Anne de Monts.

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WHITCOMB LOCOMOTIVES

MOVE ROCK at Chile's HUGE POWER PROJECT

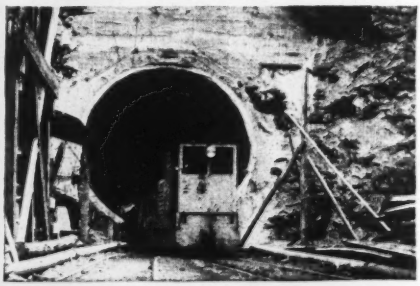
• *Top photo*—Whitcomb locomotive pushes two loaded ore cars to the dumping platform. INSET—Whitcomb locomotive and ore cars entering tunnel.

• Whitcomb locomotive pushing ore cars into mouth of one of the longest tunnels.

A FLEET of five, 8-ton Whitcomb Diesel mechanical locomotives shown busily engaged in handling tons of andesite rock, freshly blasted and cut from the tunnelways for Chile's new Hydro electric power project. Located near Santiago high in the Andes mountains, this project is designed to furnish 73,000 kilowatts of power when completed.

Whitcomb narrow gauge locomotives push self dumping ore cars (2 meter capacity) into the face of the tunnel and haul loaded cars out to waiting trucks. Frequently these powerful 8-ton locomotives handle ten or more loaded cars at one time.

• Five 8-ton Whitcomb locomotives such as one shown being used on this huge project.



Most contractors realize that in many situations locomotives will deliver more economical motive power than any other type of haulage equipment. Those who have had experience with Whitcomb locomotives are quick to specify them for jobs where they can be profitably employed.

It is possible to amortize a fleet of Whitcomb locomotives on one large contract and make money by so doing.

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Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

CONSTRUCTION REPORTS—Second Section

Third Section Construction Reports on page 122

WATER SUPPLY

BIDS ASKED

June 28

Pa., Erie—City, Water Bureau, at office City clerk, Erie, WW imprvs., Chestnut Street Pumping Station; Contr. No. 9, general construction, Contr. 10 plumbing, Contr. 11, heating; Contr. 12, electrical work, Contr. 13, chlorine storage and application facilities. Plans deposit $10. The Chester Engineers, 210 East Park Way, Pittsburgh, Zone 12, engrs.

June 30

Neb., Wallace—City, Gordon Spaulding, clk., WW sys. $54,802. Henningson Eng. Co., Standard Oil Bldg., Omaha, engr.

About July 1

Ark., Wynne—City, WW imprvs, $60,000. Marion L. Crist & Assoc., Union Life Bldg., Little Rock, engrs. Extended date. CD 4/29—ENR 5/26.

Mass., New Bedford—City, H. C. Mandell, supt. Water Dpt., water sys., incl. screen house, pump, station alterations, installing pumping equip., and connecting watermains, Quittacas Pumping Station. Plans deposit $15. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs.

July 7

†Montana—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., bulkhead gates and bulkhead gate lifting beam for Bluffs Horse Power Plant, Hungry Horse Proj., Spec. 2663. Extended date. CD 5/10—ENR 5/12.

SOON LETS CONTRACT

Ala., Lanett—West Point Mfg. Co., c/o Wiedeman & Singleton, engrs., C & S National Bank Bldg., Atlanta, Ga., soon lets contract water supply imprvs.

Mich., Detroit—Wayne Co. Road Comn., Barium Tower, Detroit, soon lets contract 24 in. feeder main, to serve Allen Park. Approx. $200,000.

LOW BIDDERS

●Calif., Los Angeles—Dpt. Water & Power, 207 S. Broadway, June 15, Baldwin Hills Reservoir Proj., from Kemper Constr. Co., 3701 Overland Ave., **$1,051,827.** CD 5/24.

†Ind., Cannelton—U. S. Eng., 836 West Broadway, Louisville, Ky., June 14, pumping plants, incl. 3 concrete structures, concrete substructure, brick substructure walls, etc., 1 storage vault, discharge pipelines, sewers, 2 sluice gates, piping and valves, equip. (transformer substations, from Allen Murphy Co., Murfreesboro Rd., Nashville, Tenn., **$178,607.** CD 5/13.

CONTRACTS AWARDED

Calif., Los Angeles — Metropolitan Water Dist., 306 W. 3d St., 28 mi. 54 in. rein.-con. Virtuduct, Lateral 16, Portions, to United Concrete Pipe Corp., Box 245, Baldwin Park, **$555,302.** Bids 6/1, awarded 6/10, CD 6/7, under LB.

Mich., Detroit—Wayne Co. Rd. Comn., Barium Tower, Zone 28, out-county water sys., serving LaSonia Twp., pumphouse, to Joseph Plozay, 4329 Central St.***watermain, to tap Detroit Water Sys., to Sugden & Sivier, Inc., 2323 E. Eight Mile Rd.*** 500,000 gal. elevated water tank, to Chicago Bridge & Iron Co., 332 S. Michigan St., Chicago, Ill. Approx. **$400,000.**

Tex., Forth Worth—City, W. O. Jones, mgr., Fort Worth, 6 mg. clear water storage well at Holly Plant, to Glade-Friedman-Byrne, Century Bldg., **$730,000.** Joel Stephens, c/o owner, Dir. Water Dept. CD 2/28—ENR 3/17.

Utah., Salt Lake City—City, c/o Irma Bitner, recdr., City and County Bldg., 12,000 ft. 48 in. rein.-con. supply watermain from Park Reservoir to 17 South and Foothill Dr., to United Concrete Pipe Corp., 419 W. Arrow Hy., Baldwin Park, Los Angeles, Calif., **$362,050.** W. D. Beers, city engr. Bids 6/1, CD 3/24—ENR 4/14.

SEWERS, WASTE DISPOSAL

BIDS ASKED

June 27

Minn., Moorhead—City, P. A. Cook, clk., City Hall, Sewage Pump. Stations 4, 5, 6 and 7, remodeling, addns. to Pump. Station 2, imprv. waste treatment plant, $200,000. Plans deposit $25. W. C. Larson, Detroit Lakes, Minn., engr. CD 7/24/48—ENR 7/8/48, under LB.

Pa., Phila.—Dpt. P. Wks., City Hall Annex, sewers, various locations, Schedule A. Approx. $100,000. sewers, various locations, Schedule B. Approx. **$100,000.** A. Zane Hoffman, c/o owner, ch. engr. CD 1/31/45.

June 28

Wis., Kiel—City, sewage treatment plant addn., incl. motors, pumps, screens, chamber equip., rotary distributors and digester equip. $132,000. Plans deposit $15. J. Donohue Eng. Co., 608 N. 8 St., Sheboygan, engr. CD 11/18/48—ENR 12/30/48.

June 29

Ill., Champaign-Urbana—Urbana-Champaign Sanitary Dist., Urbana, sewage works, incl. settling basin, settling tank revision, sludge pump and flusher mechanism. CD 5/23/47—ENR 6/12/47.

N. Y., New York—President Bronx Boro, 851 Grand Concourse, Zone 51, reconstructing combined sewer, appurtenances, Sedgwick Ave. between Fordham Rd. and Webb Ave.; Webb Ave., between Sedgwick Ave. and 188 St.; W. 188 St. between Webb and Grand Aves., etc. CD 7/24/48—ENR 8/19/44.

June 30

Ind., Indianapolis—Bd. P. Wks., City Hall, storm sewer, York St. from Kentucky Ave. to White River. $149,000. M. G. Jonson, City Hall, city engr. CD 4/8—ENR 4/28.

July 1

Ind., Richmond—Sanitary Dist., Richmond, sewage treatment plant, $750,000. Plans deposit $50. H. B. Steeg & Assoc., 2331 K. Meridian St., Indianapolis, consult. engrs. CD 4/29.

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, storm sewers, Garland St., Allen, Bijou, Devon, Everett and Florence Aves., sanitary sewers Allen, Bijou, Channel, Devon, Everett and Gerritsen Aves., Aster, Bevy, Celest, Dictum, Ebony, Fane, Garland, Hazel, Ira, Jovat and Knight Cts. CD 5/17—ENR 5/27.

July 5

●N. J., Hackensack—Bergen Co.-Hackensack River Sanitary Sewer Dist., Auth., Bergen Co. Administrative Bldg., Hackensack, Sect. 1 and 1-A Overpeck Valley Joint Sewage Works, Bogert-Child Eng. Assocs., 624 Madison Ave., New York, 22, N. Y., engrs. Bids May 6 rejected, Contr. 1, L.B. **$3,819,000;** Contr. 15, L.B. **$958,810;** CD 5/23, Contr. 8, L.B. **$889,-271;** Contr. 12, L.B. **$58,069;** Contr. 13, L.B. **$160,000.** CD 5/25, under LB.

July 6

Alaska, Ketchikan—City, City Hall, 14,000 ft. Ketchikan Creek sewers, 4,000 ft. sanitary and storm sewers, 4,000 sq. yd. c. cone. Approx. $50,000. L. D. Hubbard, city engr. CD 7/20/45.

July 7

Calif., Corte Madera—Sanitary Dist. 2, City Hall, sewage pump station and 10,000 lin. ft. 12 in. welded steel pipe force main. Approx. $50,000. Plans deposit $15. Frank Aitken, Jr., 533 Magnolia St., Larkspur, and Harry S. Jenks, 63 Crescent Dr., Palo Alto, engrs. CD 5/16—ENR 6/9.

N. Y., Irondequoit—Town, at office Fred E. Hussey, clk., 1340 Ridge Rd., Irondequoit (Rochester 5), addns. housing and storage bldg. in connection with present plant of North St. Paul Sewer Dist., increase, imprv. and reconstruct facilities, appurtenances, modification of existing plan of sewage. Plans deposit $10.

August 8

N. Y., Yonkers—At office Frank Van Blarcom, secy. Bd. Contract & Supply, City Hall, refuse incinerator. Plans deposit $50. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs.; adv. ENR 6/23. CD 10/1/45.

LOW BIDDERS

D. C., Wash.—Dist. Comrs., District Bldg., June 13, Emerson St. Storm Sewer, Sect. 2, and South Dakota Ave. sanitary sewer N.E., from The Lyon Butler Co., **$416** Georgia Ave., Silver Spring, Md., **$692,252.** CD 5/26.

PROJECTS COVERED

Projects—By Site

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $25,000; other public works $50,000; industrial buildings $68,-000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final report published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

●Wyo., Cheyenne—City, cancelled bids to have been opened June 21, sewage disposal plant, **$1,100,000.** CD 6/8.

Que., Dorval—Municipality, collector sewer, from Atlas Constr. Co. Ltd., 4781 Ste. Catherine St. W., Montreal. **$594,014.** J. A. Lalonde & Co. Ltd., 958 Dunlop Ave., Outremont, engr. CD 1/4—ENR 2/3.

CONTRACTS AWARDED

●N. J., Vineland—Landis Twp. Sewage Auth., Vineland, sanitary sewers to A. J. Ellis, 4 and Courtland Sts., Phila. **$694,193.** Bids 5/19. CD 5/26—ENR 6/3, under LB.

●N. Y., Mineola—Bd. Supervs. Nassau Co., Old Courthouse, Franklin Ave., sewage treatment plant at Bay Park, to Hendrickson Bros., Inc., 83 N. Central Ave., Valley Stream **$6,-206,805.** Bids 5/17. CD 5/19, under LB.

Pa., Phila.—Dpt. P. Wks., City Hall Annex, Sewer R-1, various locations, to Yetman & Co., 1201 Hilton St., **$84,422;** Sewers R-2, various locations, to A. DiSandro, 937 Unruh St., **$78,432.** Bids 6/3. A. Zane Hoffman, c/o owner, ch. engr.

Wash., Selah—Town, Town Hall, general contract sewage treatment plant, to Lidral Constr. Co., Securities Bldg., Seattle, Zone 1, **$125,482.** G. D. Hall & Assoc., Larson Bldg., Yakima, engrs.

BRIDGES

BIDS ASKED

July 6

Minn., New Ulm—Brown Co., C. E. Schmid, aud., New Ulm, 160 ft. high truss span Bridge 6535 over Big Cottonwood River, 3.5 mi. east of Springfield, S. P. 08-505-02 (SAR 7), Minn., Proj. S. 106 (1). **$50,000.** Plans deposit 30c.

July 7

●N. J., Freehold—Bd. Freeholders Monmouth Co., Freehold, concrete bascule bridge, $1,350,-000. CD 12/12/45.

July 14

●†Texas—U. S. Eng., 606 Santa Fe Bldg., Galveston, rein.-con. substructures for Towash and Cedar Creeks and Brazos River bridges, M-K-T. Ry. track relocation proj., Inv. No. Eng-41-243-49-303. $2,000,000. Extended date. CD 5/23.

LOW BIDDERS

D. C., Wash.—Dist. Comrs., District Bldg., 14 St. and Pennsylvania Ave., Zone 4, June 3, rein.-con. bridge deck incl. roadway and sidewalk slab for superstructure of East 14 Street Bridge, over Potomac River, from Zerkel Constr. Co., 1011 29 St. N. W. **$186,732.** CD 5/16.

Illinois—State Hy. Dpt., Springfield, June 10, 2 bridges Ill. Rt. 737, Madison Co., from Madison Constr. Co., Box 222, Edwardsville, **$77,459***bridge, Ill. Rt. 513, Vermilion Co., Contracting Constr. Co., P. O. Box 228, Danville, **$76,908***superstructure, structural steel, grade separation, Ill. Rt. 11, Vermilion Co., from McCalman Constr. Co., 619 Secton St., Danville, **$76,936.** CD 6/2.

●N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, June 15, east abutment approach ramps and superstructure for new south unit of new Unionport Bridge over Westchester Creek at Bruckner Blvd., Bronx Boro, from William M. Moore & Lopuer Constr. Co., 75 W. 190 St., Zone 63, **$1,338,000.** CD 5/26.

N. Y., Syracuse—New York Central R.R. Co., George A. Noren, ch. engr., 466 Lexington Ave., New York, Zone 17, May 31, grade crossing elimination at Hiawatha Blvd., from A. W. Wikstrom, 125 Mottville Rd., Skaneateles, **$365,981.** CD 5/12—ENR 5/19.

Oklahoma—State Hy. Dpt., Oklahoma City, June 7, erecting structural steel on 2 bridges over Mountain Fork River on U.S. 70 near Broken Bow, Pushmataha Co., from Amis Const. Co., 1647 Exchange St., Oklahoma City, Zone 8, **$68,347** Est. $60,692; received no bids June 7, rein.-con. bridge on farm-to-market road, Jackson Co., **$15,497,** S. K. McClelland, c/o owner, engr.

Virginia—State Hy. Dpt., Richmond, June 14, bridge across Laurel Creek and 1.43 mi. macad. approaches north from the Tennessee State Line, Route 91, Washington Co., from Albert Bros. Contractors, Inc., 11022 Tennessee St., Kansas City, Mo. bridge across Tuckahoe Creek and 1.05 mi. approaches Secondary Route 650, Henrico and Goochland Counties, from J. E. Courtney, King and Queen Court House, **$34,756***, 1.37 mi. macad. approaches to Nimmo Bridge, Route 147, Henrico, Chesterfield Counties and city of Richmond, from Albert Bros. Contractors, Inc., 1102 Tennessee St., Salem. **$171,021.** CD 6/1.

CONTRACTS AWARDED

Nebraska—State Dpt. Roads & Irrigation, Lincoln, 1 bridge Orleans South, ER—S—14, to Enoch & Olson, 529 Insurance Exchange Bldg., Sioux City, Ia., **$152,742.** Bids 5/26. CD 5/19.

●New York—Bureau Contracts & Accounts, P. Wks., Albany, 0.22 mi. section Cross-Bronx Expressway from Amsterdam Ave. to west end of Washington Bridge, New York Co., to Poirier & McLane Corp., 33 W. 42 St., New York, Zone 18, **$1,088,259.** Bids 4/20. CD 4/22, under LB.

Oklahoma—State Hy. Dpt., Oklahoma City, rein.-con. bridge State Hy. 49, Noble Co., to S.S. & W. Constr. Co., Insurance Bldg., Oklahoma City, Zone 2, **$50,875** est. $59,652***

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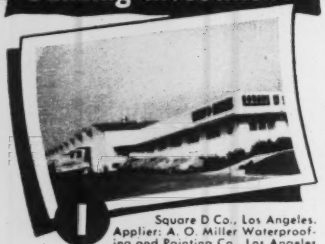

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steel truss span on timber piers, State Hy. Johnston Co., to Frost Constr. Co., Hydro, **$66,986** est. $68,176***rein.con. bridges, farm-to-market road west of Mullhall, Logan Co., to Pool Constr. Co., Shawnee, **$145,746** est. $164,761. Grand total $263,607. Bids 6/7.

Que., Montreal—Municipality, reconstruction viaduct over Canadian Pacific R.R. tracks, Ste. Catherine St. E., to Charles Duranceau Ltd., 2545 Jacques Hertel St., **$508,000.** CD 5/24, under LB.

STREETS AND ROADS

BIDS ASKED

June 28

Ind., Fort Wayne—Bd. Wks., Fort Wayne, repaving sect. Anthony Blvd. from Maumee Ave. to 40 ft. south of south right-of-way, Wabash R. R.; repaving 3 sects. Lafayette St. from Rudisill Blvd. to McKinnie Ave. from Rudisill Blvd. to Oxford St., and from Leith to Dalman Sts., $100,000. CD 7/30.43 —ENR 8/5/43.

June 29

Md., Baltimore—Mayor & City Council, City Hall. Potee St. exten. over Patapsco River. Plans deposit $10. J. H. McKay, hy. engr. CD 11/20/46—ENR 12/12/46.

June 30

Tex., Tahoka—City, K. R. Durham, mayor, street imprvs. and paving, 76,360 sq. yd. 6 in. caliche, triple pen. asph., 59,680 lin. ft. concrete curb and gutters, 54,254 sq. yd. seal coat. $175,000. Plans deposit $5. Hasse & Green Eng. Co., P. O. Box 1139, Lubbock, engr.

July 1

N. Y., Brooklyn—President Brooklyn Boro, Boro Hall, Zone 2, grading, curbing, flagging, Allen and Bijou Aves.; Garland, Ebony, Aster, Bevy, Celest and Hart Cts.

July 8

†Minnesota—P. Rd. Admin., 214 Globe Bldg., 4 and Cedar Sts., St. Paul.

Lake Co.—road mix or plant mix surf. 12.681 mi. Minnesota Forest Hy. Proj. 15-C2, DL. Plans deposit $10. H. J. Spelman, div. engr., adv. ENR 6/23.

SOON LETS CONTRACT

Tex., Houston—Texas Medical Center, Hermann Med. Proj. Bldg., soon lets contract c. conc. 6 streets. $50,000. F. J. Niven, 3308 Main St., and H. A. Kipp, 1206 Professional Bldg., Medical Center, consult. engrs. CD 6/16.

LOW BIDDERS

Ala., Ft. Payne—City, June 7, misc. street imprvs., from Ledbetter-Johnson, Rome, Ga., **$181,898.** CD 6/1.

Ill., Chicago—City, Dpt. Purchases, Contracts & Supplies, City Hall, June 8, from Union Const. & Eng. Co., 20 N. LaSalle St., paving W. Belmont Ave., from N. Central to N. Cicero Aves., (Sect. 9505 C. S.), **$253,-836;** from Ivy Const. Co. to N. Pulaski Rd. (Sect. 9606.1 C. S.), **$252,789;** from N. Pulaski Rd. to N. Kimball Ave. (Sect. 9707 C. S.), **$194,184*****from White Constr. Co., 1831 W. Columbus St., from N. Kimball to N. Western Aves., (Sect. 9708.2 C. S.), **$59,495;** from N. Western to N. Damen Aves., (Sect. 9303 C. S.), **$143,000;** from N. Sheffield to N. Halsted Sts. (Sect. 1010 C. S.), **$68,994*****from Rock Road Constr. Co., 5915 N. Rogers St., from N. Damen to N. Sheffield Aves., (Sect. 9910.1, C. S.), **$325,077.** CD 6/3.

Iowa—State Hy. Comn., Ames, June 7, maintenance by resurf., 2064 mi. MS-12, Divs. 1 and 2, from Western Eng. Co., Harlan, **$86,326** and **$92,168** respectively; Div. 3, from Cameron, Joyce & Co., Keokuk, **$100,173.** CD 6/4.

Kentucky—State Hy. Dpt., Frankfort, received no bids June 10, bit. surf. Class c-1, and traffic bound limestone 12.55 mi. RS (78-302) (78-282) (78-362), Marion Co., reconstruction and traffic bound surf. 5.329 mi. RS (90-485) (90-495). CD 5/25.

Kentucky—State Hy. Dpt., Frankfort, June 10, traffic bound limestone 10.731 mi. Irvington-Grahamton Rd., New Rt. U. S. 60, F 523 (2) SP (14-333) (82-423), Breckinridge and Meade Counties, from Oman Constr. Co., Ackien Park, Nashville, Tenn., **$469,012*****traffic bound limestone 10.199 mi. Sandy Hook Willard Rd., S. 111 (2), SP 32-149, Elliott Co., from Wood & Huston Bank St., Frankfort, **$342,176*****traffic bound limestone, 2.028 mi. Somerset Relief Rd., U 110 (3) U 211 (17), SP (100-535) (100-235), Pulaski Co., from Odell Constr. Co., Winchester, **$85,950***bit. surf. Class 1, 0.696 mi. N. Broadway and Main St., in Providence, F 166 (6) SP (117-349), Webster Co., from S. J. Boone, Owensboro, **$106,-367*****traffic bound limestone 6.75 mi. Forstown Rd., Verona-Mudlick Rd., RS 8-149 and RS 8-436, Boone Co., from W. L. Harper Co., Covington, **$90,763*****local bank or creek grav. 4176 mi. Oakdale-Mt. Carmel Rd., RS 13-427, Breathitt Co., from L. M. Hart Constr. Co., Inc., 1091 Manchester St., Lexington, **$61,236*****traffic bound limestone 7.274 mi. Annville-Royrader-Laurel Co. line Rd., RS 55-169, Jackson Co., from Arnett Constr. Co., Berea, **$57,954*****traffic bound limestone 8.396 mi. RS (55-169) (55-189), Jackson Co., and traffic bound limestone 9.108 mi. RS 62-361 and RS 62-361, Larue Co., from Marlowe Constr. Co., Lexington, **$116,745** and **$171,881** respectively *****traffic bound limestone 5.477 mi. River Rd., RS 62-341, Larue Co., from Nally & Ballard, Inc., Bardstown, **$81,812*****traffic bound limestone 4.161 mi. Holly Hill Rd., RS 74-213 U. S. 27, McCreary Co., from G. H. Cheek Constr. Co., McClure Bldg., Frankfort, **$61,777** *****local bank or creek grav. 3.575 mi. Botland-Manton Rd., RS 90-445, Nelson Co., from Nally, Barrard & Hamilton, Bardstown, **$71,-067*****traffic bound limestone 1.75 mi. Claxon Ridge Rd., RS 94-353, Owen Co., from Kentucky Road Oiling Co., Frankfort, **$91,887*****traffic bound limestone 6.029 mi. Mt. Pleasant Rd., RS 112-138, Trimble Co., from L. H. Hardin, Bedford, **$77,221*****bit. surf. Class 1, 15.539 mi. SP Group 37 (19491), Scott Co., from Middle West Roads Co., Nobelsville, Ind., **$138,315.** CD 5/25.

Pennsylvania—State Hy. Dpt., Harrisburg, June 10, wid'n. pavement with c. conc. and crushed aggregate base 2 ft. wide and bit. surf. existing pavement 18 ft. wide, incl. exten. 2 structures 12,885 ft. between Rockdale and Falls Creek Boro, Washington Twp., L. R. 630, Sec. R-1, T. R. 830, Jefferson Co., from A. J. Fasenmyer, 210 Security Peoples Bldg., Erie, **$92,662*****crushed aggregate base, bit. surf. one 1-span bridge, Sect. 2 over Hokendauqua Creek, 2,150 ft. L. R. 48061, Northampton Co., from Kingston Constr. Co., Shenandoah, **$81,708*****c. conc. bit. surf. 12.41 ft. or 12.23 ft. wide on each side of trolley franchise width, surf. 2 ft. width of existing base in trolley franchise width adjacent to outside rails with bit. surf.; c. conc. with relaid block pavement for trolley crossings and bit. surf. existing base course 44,672 ft. and variable in width, 2,781 ft. 42 St., Phila. L. R. 67002, Sect. 1, 67008, Sect. 1, Philadelphia Co., from Union Paving Co., Broad and Tulip Sts., Phila., **$77,109.** CD 5/18—ENR 5/26.

Tex., Houston—Harris Co., Courthouse, June 7, 1.7 mi. asph. topping and small bridge of Bay Ridge River Unit from Holland Page Constr. Co., Georgetown Rd., Austin, **$101,802.** Est. $88,435. CD 5/25.

Tex., Lubbock—City, May 31, street imprvs. and paving, from Holland Page, Georgetown Rd., Austin, **$148,716.** R. L. Oldham, Lubbock, engr.

Virginia—State Hy. Dpt., Richmond, wid'n, resurf. 0.41 mi. U. S. 50 at eastern city limits of Winchester, Frederick Co., from Garrett, Moon & Pool, Blackstone, **$64,977*****c. conc. 1.57 mi. Route 147 from Route 24 (Cobbs Pike) to east of the Henry G. Shirley Memorial Hy., Arlington Co., from W. H. Scott, Franklin, **$638,677*****stabil. base and surf. tr. 4.22 mi. Route 2 from north of Lively to Lancaster-Richmond Co. line, Lancaster Co., from James Gibbons Co., Relay, Md., **$58,121*****macad. 3.84 mi. U. S. 21 and 52 from Monroe St. in Wytheville to 3.31 mi. north of the corporate limits of Wytheville, Wytheville Co., from Pendleton Constr. Corp., Wytheville, **$252,426*****stabil. base, surf. cr. 3.95 mi. Secondary Route 606 between Herndon and Brown's Chapel, Fairfax Co., from R. W. Mitchell Co., Winchester, **$74,052*****6.5 mi. Secondary Route 707, 663, 673 between Buggs Island Dam access road and Union Level, Mecklenburg Co., from D. W. Winkleman, Greensboro, **$67,587*****received no bids June 14, stabil. base, surf. tr. 0.44 mi. Secondary Route 639 west from intersection of U. S. 13, Northampton Co. CD 6/1.

†Wash., Richland—U. S. Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash., D. C., paving, earthwork, waterlines, sewer facilities, from J. F. Shea Constr. & Sons, Inc., 4011 Fairview Ave., Boise, Idaho, **$722,578.**

Wis., Milwaukee—City, City Hall, 200 E. Wells St., asph. paving W. Howard Ave., from Wm. F. Hunt, 2808 N. Sherman Blvd., **$110,-169.** J. P. Schwada, city engr. CD 12/3/43.

CONTRACTS AWARDED

●California—State Div. Hys., State Bldg., Los Angeles, c. conc. on cement treated subgrade 1.6 mi. Hollywood Parkway between Virgil Ave. and Glendale Blvd., Los Angeles Co., to N. M. Ball Sons, Box 430, Berkeley, **$1,287,397.** CD 5/9.

●Maryland—State Hy. Dpt., Baltimore, grading, drainage, surf., 5.49 mi. dual highway along U. S. 40, beginning at Pine Orchard and exten. northwesterly to West Friendship, Contr. HO 234-1-315, FAP FI 449 (7), Howard Co., to T. E. Ritter Corp., 426 W. York St. Norfolk, Va., **$1,889,397.** Bids 5/24, awarded 6/8. CD 6/4—ENR 6/9, under LB.

●Montana—State Hy. Dpt., Helena, grading, draining 7.2 mi. Helena-Wilborn Rd., to Dilsworth & Pumnea, Helena, **$157,903*****c. conc. and underpass 0.14 mi. Livingston to McLaughlin Creek, Constr. Co., Livingston, **$110,109*****grav. 14 mi. Harlem-Turner Rd., to Lalonde Constr. Co., Sidney, **$125,990*****grav. 6.5 mi. Livingston-Swingley Rd., to Cal Tibbs, Cowley, Wyo., **$146,429*****grav. 4.65 mi. Colstrip-Forsyth Rd., to Torgenson & Eisele, Sheridan, Wyo., **$60,520*****crushing, stockpiling grav. Flathead and Lincoln Counties, to Kelly Co., east of Butte, **$80,490*****crushing, stockpiling grav. Gallatin Park and Madison Counties, to Peter Kiewit Co., Sheridan, Wyo., **$67,005.** Grand total $1,048,365. Bids 6/9. CD 5/4—ENR 5/12.

New York—Bureau Contracts & Accounts, Albany, reconstructing 4.36 mi. Southern State Parkway from Cross Island Parkway to North Village Ave. in Malverne, Nassau Co., to John C. Peterson Constr. Corp., 113 S. Grand Ave., Baldwin, **$987,881.** Bids 4/20. CD 4/22, under L. R.

●Oklahoma—State Hy. Dpt., Oklahoma City, stabil. Calie base, double bit. surf. 3.009 mi. Cimarron Co. and stabil. Calie base, double bit. surf. 3.381 mi. Cimarron Co., to Park-Ward Co., Insurance Bldg., Oklahoma City, **$70,234** est. $74,556 and **$61,339** est. $58,213

respectively***c. conc. 2.001 mi. State Hy. 40, and c. conc. 6.481 mi. State Hy. 40, at Morrison, both Noble Co., to Brooks & Dahlgren, Insurance Bldg., Oklahoma City. Zone 2, **$98,805** est. $105,750 and **$311,351** est. $333,939 respectively***stabil. base rock asph. surf. 4.612 mi. State Hy. 9, Haskell Co., and b. conc. 7.664 mi. State Hy. 7 east of Elmore City, Garvin Co., to Layman & Co., Riverside Dr., Tulsa, **$194,174** est. $189,245 and **$369,558** est. $374,386 respectively***c. conc. 3.725 mi. and gravel base, with double bit. surf. tr. 2.975 mi. State Hy. 3 at Quinton, Pittsburg Co., to Steinberg Constr. Co., Tulsoma Bldg., Tulsa, **$63,794** est. $60,276***asph. stabil. base, single bit. surf. 7.407 mi. U. S. 270 at Turpin, Beaver Co., to Standard Paving Co., 2119 E. 11 St., Tulsa, Zone 5, **$180,811** est. $178,054*** traffic bound surf. course 7.433 mi. Muskogee Co., to Anderson & Merritt, McAlester, **$55,457** est. $65,787***stabil. base, double bit. surf. 5.758 mi. U. S. 59, Adair Co., to Public Constr. Co., Barnes Bldg., Muskogee, **$180,410** est. $180,711***traffic bound surf. 4.986 mi. Woods Co., to McMichael Concrete Co., Tulsoma Bldg., Tulsa, **$66,183** est. $80,556***traffic bound surf. 2.975 mi. Kay Co., to S. & S. Const. Co., Ponca City, **$51,470** est. $47,090*** traffic bound course 6.06 mi. U. S. Hy. 59 south of Jay, Delaware Co., to S. E. Evans Constr. Co., 2914 N. O St., Fort Smith, Ark., **$193,957** est. $226,390*** traffic bound surf. 5.676 mi. farm-to-market road west of Mullhall, Logan Co., to G. E. Keck, Fairview, **$170,237** est. $211,408***traffic bound surf. course 7.988 mi. farm-to-market road, Grant Co., to Clark Constr. Co., Pawnee, **$50,925** est. $56,524. Grand total $2,118,405. Bids 6/7. CD 5/26.

Pennsylvania—State Hy. Dpt., Harrisburg, c. conc. paving, incl. 1. rein.-con. structure, bit. 18,413 ft. L. R. 361 (4), T. R. 115 from point 2.1 mi. from Pikes Creek to point 1.5 mi. northwest of Dallas Boro., Luzerne Co., to Ryan Bros., Inc., Clearfield, **$507,028.** Bids 6/3. CD 6/8—ENR 6/16, under L.B.

Tex., Dallas—Dallas Co., Courthouse, 120 mi. road surf. Precinct 1, **$72,000**; 70 mi. road resurf., Precinct 2, **$140,000**; addnl. resurf. 60 mi. roads, Precinct 3, **$120,000**; addnl. road resurf. Precinct 4, **$111,300**, force account. Grand total $443,300. CD 5/16.

Utah—State Road Comn., Salt Lake City, gray. 6.535 mi. highway between Elgin and Hastings Ranch, FASP No. S-268 (1), Grand Co. to Anderson Constr. Co., Price, **$66,362** est. $94,412***road mix, oil. surf. 1.818 mi. state road between Loa and Fremont, FASP No. S-255 (1), Wayne Co., L. A. Young Constr. Co., Richfield, **$71,735** est. $89,577*** gray. 13.419 mi. highway between Paragonah and Orton, FASP No. S-289 (1), Iron Co., to Reynolds Constr. Co., Springville, **$227,360** est. $237,354*** plant mix bit. roadway 2.777 mi. between Summit Co. line and Lamb's Canyon, U. S. No. 40, FAP No. FI-97 (15), Salt Lake Co., to W. W. Clyde & Co., Springville, **$393,542** est. $405,470. Grand total $759,029. Bids 5/27. CD 5/18.

●**Washington**—State Hy. Dpt., Olympia, clearing, drainage, grading, landscaping 5.888 mi. Primary State Hy. 1, Secondary State Hy. 1-B, Castle Rock to Toutle River, F.A.P. FI-001-1 (2), Cowlitz Co., to N. Florito Co., 844 W. 48 St., Seattle, **$697,867***grading, b.conc. surf., c.conc., rein.-con. box culvert 6.53 mi. State Hys. 1 and 12, Longview Wye to Ostrander, F.A.P. FI-001-1(3), FI-001-1(5) and UI-00-1(4), Unit 1, Cowlitz Co., to Peter Kiewit Sons Co., Longview, **$814,182**, CD 6/1 ***bit. surf. tr., b. conc. 2.558 mi. Primary State Hy. 9, Hoquiam north Grays Harbor Co., to Pacific Sand & Gravel Co., Centralia, **$82,142***resurf., bit. surf. tr., road mix 3.169 mi. Secondary State Hy. 1-D, Oak Harbor to Coupeville, Island Co., to Diesel Oil Sales Co., 2155 Northlake Ave., Seattle, **$77,306***b.conc. 9.902 mi. Primary State Hy. 3, Teanaway to junction with Secondary State Hy. 3-M to Western Asphalt Co., 309 W. 39 St., Seattle, **$123,281***b.conc. 8.339 mi. Primary State Hys. 3 and 6 and Yakima Co. road, Ellensburg to Yakim, Kittitas and Yakima Counties, to Columbia Asphtal Paving Co., Yakima, **$126,879***c.conc. and rein.-con. bridge, 2.718 mi. Primary State Hy. 2 Reardan to Spokane Co. line, Lincoln Co., to C. A. Power, E. 915 Mariettta St., Spokane, **$231,790***c.conc. 0.717 mi. Primary State Hy. 6, Boone Creek vicinity, Spokane Co., to Sather & Son, Yardley, **$53,113**, Grand total $2,227,460. Bids 6/10. CD 5/26.

●†**Alaska**—Alaska Road Comn., Juneau, 41 mi. Haines Hy., First Judicial Dist., to Lytle & Green Constr., 312 Masonic Temple Bldg., Des Moines, Ia., and Anchorage, **$1,591,073.** Bids 6/1. CD 6/7, under L.B.

EARTHWORK, WATERWAYS

BIDS ASKED

June 28

†Maryland and West Virginia—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., local flood protection, Cumberland, Md. and Ridgeley, W. Va., incl. foundation and exploration drilling, Serial No. Eng. 49-080-49-197.

†South Carolina—U. S. Eng., Customhouse, Charleston, dredging Winyah Bay 27 ft. Proj. George Channell near Georgetown, Serial No. Eng-58-081-49-29.

June 29

†Ill., Harrisburg—U. S. Eng., P. O. Box 59, Louisville, I. Ky., repairing Pankey Branch Pumping Plant, Serial No. Eng. 15-029-49-176.

†Nebraska—Bureau Reclamation, Dpt. Interior, Trenton, Trenton Dam foundation construction, Frenchman-Cambridge Div., Missouri River Basin proj. on Republican River,

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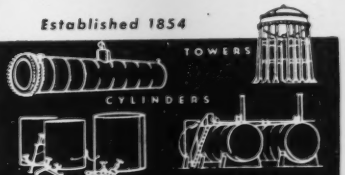

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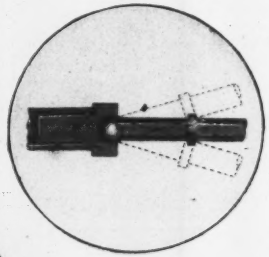

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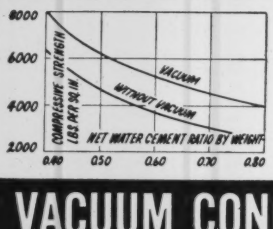

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†Nebraska—U. S. Eng., 1709 Jackson St., Omaha, agricultural levees Unit R-548, Sects. 1 and 2, near Brownville. Serial No. Eng-25-068-49-287. Bids 6/9 rejected. L. B. **$385,-610.** CD 5/19.

Ontario—Secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, breakwater exten., Salmon Point. Approx. $50,000. Plans deposit $10. R. Blais, c/o owner, engr.

Ont., Port Arthur—J. M. Somerville, secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, breakwater. Approx. $60,000. Plans deposit $20. R. Blais, c/o owner, engrs.

June 30

Minn., Mankato—Blue Earth Co., N. E. Lee, aud., Mankato, County Ditch 78, incl. 67,400 lin. ft. open ditch, 454,437 cu. yd. excav., furnish, install 9,100 lin. ft. 8- to 20-in. drain tile, etc. $75,500. CD 10/2—ENR 10/7, under LB.

Pennsylvania—Dpt. Forests & Waters, 405 Education Bldg., Harrisburg, Lake Jean Dam at Ricketts Glen State Park, Luzerne Co. $344,000. Plans deposit $25. Knappen Tippetts Abbett Eng. Co., 62 W. 47 St., New York, N. Y., engr.

July 1

†Washington—U. S. Eng., 19 E. Poplar St., Walla Walla, designing, furnishing, installing, testing sluice gates for Mill Creek Flood Control Proj. in vicinity of Walla Walla. Serial No. Eng-45-164-49-112.

July 5

Calif., Los Angeles—Bd. Supervs., Los Angeles Co., 501 Hall of Records, asphaltic lined channel in Saw Pit Wash, Monrovia. Approx. $28,000. H. E. Hedger, Co. Flood Control engr.

July 6

†California—U. S. Eng., Wright Bldg., Sacramento, sluice gates, appurtenances for Pine Flat Dam Proj. Plans deposit $25.

July 7

†California and Arizona—Bureau Reclamation, Dpt. Interior, Phoenix, Ariz., grading plots, erecting warehouses and fencing for Hyeth, Gila, Calif. and Prescott, Electric Distr. No. 5, Mesa and Tucson, Ariz. substations. Spec. R3-PX-17. (Region 3). L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr.

†Montana—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Coram, rails, rail accessories, miscellaneous structural steel, Hungry Horse Power Plant, Hungry Horse Proj. Spec. 2710. L. N. McClellan, c/o owner, ch. engr.

LOW BIDDERS

●†California—Bureau Reclamation, Dpt. Interior, Tracy, June 7, earthwork, concrete lining, structures for Delta Mendota Canal, Station 2149 plus 80 to 3924 plus 80, about 4 mi. west of Newman, Central Valley Proj., Spec. 2649, from Western Conts. Corp.; Hubert Everist St., Box 100, Westley. **$4,-165,764.** CD 4/26—ENR 4/28.

La., Rayville—Richland Parish Police Jury, Rayville, May 31, approx. 3,515,600 cu. yd. channel excav., 66.72 acres clearing and grubbing from L. M. Ray Constr. Co., Monroe, **$356,476.** CD 5/16—ENR 5/19.

†Nebraska—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., rejected bids June 3, Levee Unit 513-512 R, Sect. H along right bank Missouri River and along both banks Nemaha River south of Rulo, new Serial No. Eng-25-028-49-231. L. B. **$635,320.** CD 6/10—ENR 6/16, under LB.

●†New York—U. S. Eng., 925 New Federal Bldg., Pittsburgh, 19, Pa., June 10, Olean Flood Projection Proj. Unit 2, Contr. Sect. A, Allegheny River. Serial 36-058-49-128, from Elmhurst Contg. Co., Inc., 53-09 97 Pl., Corona, **$1,059,641.** Est. $939,027. CD 6/6.

†Oregon—U. S. Eng., Pittock Block, Portland, Zone 5, June 15, clearing damsite and borrow areas and construction portion earthfill dam embankment, excavating for concrete spillway and construct river diversion channel at Lookout Point damsite diversion, southeast of Eugene on Middle Fork of Willamette River, Lane Co., Eng-35-025-49-512, from C. F. Lytle Co. and Amis Constr. Co., Moses Lake, Wash., **$991,370.** Est. $1,435,-054. CD 5/25.

†Tennessee—U. S. Eng., P. O. Box 97, Memphis, Zone 1, June 8, Workhouse Bayou Pumping Station, Memphis, approx. 100 ft. west of Brookins St. and approx. 200 ft. north of Shannon Ave., Serial No. Eng., 40-041-49-123, from Consolidated Contractors, 1489 Thomas St., Memphis. **$422,321.** CD 4/27—ENR 5/5.

●†Tex., Texarkana—U. S. Eng., foot of Prytania St., New Orleans 9, La., June 9, construct Terrace sect. of Texarkana Dam, incl. 2,500,000 cu. yd. compacted fill, 137,000 cu. yd. dumped riprap, 55,000 cl. yd. filter gravel road, drainage strs., Inv No. 49-281, from Moss Thornton Co., Leeds, Ala. **$2,346,376.** Est. $1,875,000. CD 5/2—ENR 5/26.

†Wis., Port Wing—U. S. Eng., P. O. Box 248, Duluth 1, Minn., May 25, repairing east pier, etc., Port Wing Harbor, Inv. No. Eng-21-001-49-17, from Hubert E. Cloutier,

2108 E. 7 St., Superior, **$117,748.** Est. $113,847. CD 5/4—ENR 5/19.

CONTRACTS AWARDED

●†Illinois—U. S. Eng., 826 U. S. Court House & Custom House, St. Louis, Mo., excavation canal and construct levee, Mississippi River, Chain of Rocks Canal, Granite City, Serial No. Eng. 23-065-49-120, to McWilliams Dredging Corp., 859 St. Charles St., New Orleans, La., **$7,369,754.** Est. $6,775,653. CD 6/3, under LB.

†Louisiana—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, Jetties mouth of waterway, Empire, Plaquemine Parish, Serial No. Eng-016-47-49-266, to Hough-Cowgur & Co., Inc., 320 N. 4 St., St. Louis, Mo., **$559,308.** Bids 5/19, awarded 5/20. CD 5/17—ENR 5/19, under LB.

†Mississippi—U. S. Eng., P. O. Box 60, Vicksburg. Walker Lake Pumping Station, Greenwood, Leflore Co., Serial No. Eng., 22-5032-49-150, to L. M. Ray Constr. Co., 2220 Louisville Ave., Monroe, La., **$496,718.** CD 3/25—ENR 3/31.

†South Carolina—U. S. Eng., Custom House, Charleston, maintenance dredging, 35 ft. proj. Shoals 5A, 6 and 6A, Charleston Harbor, Eng-39-081-49-7. Hired Labor. Bids 3/1 rejected, L. B. **$193,071.** CD 3/17—ENR 3/24.

●†Virginia—U. S. Eng., foot of Front St., Norfolk, June 14, concrete dam, Philpott Reservoir Proj., Smith River, Franklin and Henry Counties, Serial No. Eng-44-110-49-18, to Bates & Rogers Constr. Corp., 600 W. Jackson St., Chicago, Ill., **$6,493,526.** Bids 6/14. CD 6/15, under LB.

AIRPORTS AND AIRBASES

BIDS ASKED

June 28

†O., Columbus—FACILITIES—U. S. Eng., P. O. Box 59, Louisville 1, Ky., Air National Guard Facilities (ramp to hangar), Lockbourne Air Force Base, Serial No. Eng-15-029-49-172.

On or About June 27

†Mass., Bedford—AIRPORT—U. S. Eng., Army Base, Boston, Zone 10, Hanscom Airport, alterations, addns.

LOW BIDDERS

†Fla., Tampa—GROUND APPROACH SYSTEM FACILITIES—U. S. Eng., Post Office Bldg., Savannah, Ga., cancelled bids to have been opened about June 21, constructing ground control approach system facilities, MacDill Air force Base. Will re-advertise. CD 6/10.

†Mich., Mount Clemens—HOUSING—U. S. Eng., 50 Merchandise Mart, Chicago 54, Ill., June 6, family quarters, Selfridge Air Force Base, Serial No. Eng. 11-032-49-191, from Atkin-Fordon, 7360 W. Chicago St., Detroit, **$119,008.** CD 5/12—ENR 6/2.

†N. M., Alamogordo—HOUSING—U. S. Eng., P.O. Box 1538, Albuquerque, June 2, fifty 25'x47 ft. frame, stucco or masonry family quarters, concrete slab fdns., Holloman Air Force Base, Serial No. Eng-29-005-49-90, basic standard design, from Ponsford Bros., 914 E. Missouri St., El Paso, Tex., **$503,210;** basic alternate design, from Liberty Builders-Houston Readycut House Co., 3601 Polk St., Houston, Tex., **$436,500.** CD 5/9—ENR 5/26.

●†S. D., Rapid City—RUNWAY—U. S. Eng., 1709 Jackson St., Omaha, Neb., June 10, facilities for Rapid City Air Force Base, Serial No. 135 from Peter Kiewit Sons Co., Omaha Natl. Bank Bldg., Omaha, Neb. **$2,119,465.** CD 5/11.

†Tex., Dallas—AIRPORT—U. S. Eng., 606 Santa Fe Bldg., Galveston, rejected bids June 7, remedial work on Hensley Field Air Base, paving, clearing and resealing runways, taxiways, aprons, 560,000 lin. ft. joints and cracks, Inv. No. Eng-41-243-49-316. CD 5/24—ENR 5/26.

†Tex., Randolph Field—HOUSING—U. S. Eng., Port Sam Houston, (Sta. San Antonio), June 15, 65 family housing units, Eng-41-243-49-296, from McKenzie Constr. Co., Transit Tower, San Antonio, **$597,087.** CD 5/18.

†Tex., San Antonio—HOUSING—U. S. Eng., 606 Santa Fe Bldg., Galveston, June 9, NCO family housing units, Inv. No. Eng-41-243-49-297, from H. B. Zachary & Co., P. O. Box 2570, Lot 1 **$540,120,** Lot 2 **$552,832.** CD 6/1.

CONTRACTS AWARDED

†Ill., Chanute Field—HOUSING—U. S. Eng., 520 Merchandise Mart, Chicago, Zone 54, family type quarters (2 story row houses) Chanute Field, to Raymond Development Co., Urbana, **$813,126.** Bids 5/24. CD 5/11—ENR 5/19.

Pa., Pittsburgh—TERMINAL BLDG.—Allegheny Co., County Office Bldg., 1 story, 144x270 ft., brick, steel terra cotta and cargo room addns. to terminal bldg., concrete floor, Greater Pittsburgh Airport, to Navarro Corp., 6219 Broad St., Pittsburgh, **$526,500.** Est. $500,000. Bids 5/3. CD 5/12, under LB.

●†Va., Gravelly Point—TERMINAL BLDG.—Pub. Bldgs. Admin., Federal Works Agency Bldg., Wash. D. C., South Exten. to Terminal Bldg. at Washington National Airport, Proj. No. 44-094-5 to P. H. Martel, 1023, 20 St., N. W., Wash., D. C., **$1,487,000.** Bids 4/14. CD 3/7.

●†Va., Langley Field—RESEARCH HANGAR—Civil Aeronautics Admin., Langley Field, flight research hangar and laboratory, West Area, Spec. L 1447, to Wise Contr. Co., 8 and Grace Sts., Richmond, **$2,601,105.** Bids 5/25. CD 6/2—ENR 6/9, under LB.

FOREIGN

Australia, Sydney—G. C. Hicks, secy., Metropolitan Water Sewerage & Drainage Bd., 341 Pitt St., Sydney, New South Wales, receiving bids August 2, supply and deliver 8 concrete buckets, Plant Tender No. 330; supply, deliver and erect sand treatment plant, Plant Tender No. 337.

LATIN AMERICA

Argentina, Buenos Aires — Municipality, water supply construction scheme to be drawn from River Plate at Palermo and pumped to Buenos Aires through concrete tunnel, to Harland Eng. Co. Ltd., Alloa, Scotland, Approx. **$3,700,000.** CD 10/16/48.

Brazil, Rio de Janeiro — Secretary General, Ministry of Pub. Wks., Ave Nilo Pacanha 12, Rio de Janeiro, receiving bids July 13, levelling Santo Antonio Hill, for Republic of Brazil, Rio de Janeiro.

Mexico — Mexican Govt., Sria. de R. H., Balderas, 94, Mexico, D. F., dam, 70 meters high, 2,060 meters wide, on the Papaloapan River proj. near Vera Cruz on the Gulf Coast, from Constructora Aguila S. A., Mexico City, **60,262,664** Pesos. CD 5/19.

Mexico, Santiago Tuxtla—Direccion de Cooperacion Interamericana de Salubridad Publica, Baldera, 94, Mexico, D. F., receiving bids July 11, waterworks. Plans deposit $2.50. Ing. Adolfo Orive Alba, D. C. IA S. P., Balderas, 94, Mexico, D. F., engr.

PUBLIC BUILDINGS

BIDS ASKED

June 27

Conn., Wilton—Bd. Educ., Town Hall, Junior High School. Plans deposit $35. Extended date O'Connor & Kilham, 101 Park Ave., New York 11, N. Y., archts. CD 6/9.

†N. Y., Brooklyn—Pub. Wks. Office, Bldg. 77, N. Y. Naval Shipyard, Naval Base, converting 3 floors and roof repairs of former hospital bldg. for use as Naval Training Center. Plans deposit $15.

†Va., Roanoke—Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, annex bldg. for Marine Corps Reserve at Naval Reserve Training Center, NOY 1883, Spec. 22610. Plans deposit $20.

On or About June 28

●Mo., St. Louis—U. S. Eng., 1709 Jackson St., Omaha, 2, Neb., repairing, altering bldgs., St. Louis Medical Depot, Serial No. Eng. 25-066-49-269.

June 28

†Ga., Camp Gordon—U. S. Eng., Post Office Bldg., Savannah, mess hall alterations, addn., Camp Gordon Hospital, Serial No. Eng.-6-133-49-199. Extended date, CD 6/6—ENR 6/9.

†Ga., Griffin—City, North Side School. Abreu & Robeson, 22 Marietta St. Bldg., Atlanta, archts.

Ga., Milledgeville—State Dpt. Welfare, State Office Bldg., Atlanta, boiler plant addn. at Georgia State Hospital, $125,000. Plans deposit $25. Fuller & Beckett, 88 Walton St. N. W., Atlanta, archts.

Minn., Canby—Bd. Educ., C. S. James, clk., City Hall, 1 story, brick, steel gymnasium-auditorium addn., to high school, $275,000 Plans deposit $15. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts. CD 5/19—ENR 6/9.

●Mo., St. Louis—U. S. Eng., 1709 Jackson St., Omaha, Neb., repairs, alterations to 5 bldgs., St. Louis Medical Depot.

Mo., Springfield—Bd. Regents, Southwest Missouri State College, Walter I. Baker, secy., Springfield, brick, concrete, stone Students Union Bldg. Plans deposit $25. Johnson & Rovinett, Landers Bldg., archts. CD 5/1/46—ENR 7/1/48.

●Neb., Omaha—U. S. Eng., 1709 Jackson St., Omaha, heating and ventilating sys.; alterations, to govt. bldg., 1709 Jackson St., Inv. 263. CD 5/26.

N. Y., New York—Dpt. Pub. Wks., Municipal Bldg., Zone 7, altering 14th, 15th, 16th and 17th floors of Municipal Bldg., Chambers and Centre Sts. Plans deposit $25.

N. Y., New York—New York City Housing Auth., 63 Park Row, Zone 7, general contract, heating and ventilating, electrical work, and plumbing for Marble Hill Houses Proj. No. NY-15-1, areas bounded by Exterior St., W. 225 St., Broadway, W. 228 St., Marble Hill Ave., and W. 230 St., Manhattan and Bronx Boros. Plans deposit $75. CD 5/18—ENR 5/26.

N. Y., New York—Superintendent School Bldgs., Design & Construction, 49 Flatbush Ave. Exten., Brooklyn, Zone 1, general contract P. S. 87 addns., Bussing, Edson and Grade Aves. Plans deposit $8. CD 2/8/45—ENR 2/22/45.

N. S., Brookfield—M. D. Rawding, minister, c/o Dpt. Highways & P. Works, Halifax, rural high school. Approx. $360,000. T. P. Lusby, c/o owner, engr. CD 8/25/47—ENR 9/4/47.

Ont., Centralia—A. J. E. Smith, c/o Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 135 houses, National Defense Dpt.-Non Urban, No. 1/49. Approx. $945,000. Plans deposit $10.

Ont., Clinton—A. J. E. Smith, engr., c/o Central Mortgage & Housing Corp., 395 Fleet

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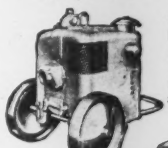

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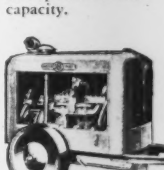

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St. W., Toronto, 95 houses, National Defense Dpt. Non Urban, No. 1/49. Approx. $665,000. Plans deposit $10. CD 3/29/48—ENR 4/15/48.

June 29

Ind., Westville—State P. Wks. & Supply Div., W. R. Myheck dir., 404 State House, Indianapolis, 2 story, 31x309 ft. brick, stone, rein.-con. childrens hospital, $260,000. Boyd Phelps, Inc., 232 Franklin St., Michigan City, archt.

N. Y.,—Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 17, street and yards improvs. and top soil and planting for Sheepshead Bay Houses, (part of Proj. No. NYC-5, in area bounded by Avenue X, Batchelder St., Avenue V and Nostrand Ave. Plans deposit $25 each.

N. Y., Mohawk—Bd. Educ., Central School Dist. 1, Mohawk, high school addn. $884,000. Plans deposit $50. Carl W. Clark, 625 James St., Syracuse, archt. CD 12/6/46.

N. C., Madison—Madison School Bd., Madison, school. Plans deposit $50. Lindsey M. Gudger, 52 Carter St., Asheville, archt.

N. C., South Reidsville—Rockingham Co. Bd. Educ., Madison, school. Plans deposit $50. Lindsey M. Gudger, 52 Carter St., Asheville, archt.

Pa., Lancaster — Dpt. Welfare, State of Penna., Harrisburg, 4 story, U shaped, 180x190 ft. hospital bldg. addns. and alterations, 1 story, 65x90 ft. utilities bldg. Plans deposit $54.54. James R. Edmunds Jr., 130 W. Hamilton St., Baltimore, Md., archt. Faisant & Kooken, 347 N. Charles St., Baltimore, Md., structural engrs. Henry Adams, Inc., 2315 St. Paul St., Baltimore, Md., mechanical engr.

Pa., Philipsburg—Dpt. Property & Supplies, Ira and Herr Sts., Harrisburg, constr. and chimney, coal silo and ash silo for relocated boiler plant and enlarge laundry at Philipsburg State Hospital, $250,000. Plans deposit $7.50. Gutter & Diehl, 321 N. Front St., Harrisburg, engrs.

Tenn., Nashville—Bd. Educ., W. A. Bass, supt., 700 Broadway, construct Hattie R. Cotton school. Plans deposit $200. Marr & Holman, 702 Stahlman Bldg., archts.

Wis., Eau Claire—Bd. Educ., Eau Claire, 7th Ward School, addn. and alterations $250,000. Plans deposit $25. F. Kilinger & Assoc., 218 S. Barstow St., archts. CD 2/27/48—ENR 3/18/48.

Wyo., Laramie—Albany Co., Ivinson Memorial Hospital, $350,000. W. E. Hitchcock, Laramie, archt. CD 9/2—ENR 9/18.

Conn., Milford—Milford Housing Auth., Town Clks. office, Town duplex frame houses, 34 family units, Milford Point Rd. $300,000. Plans deposit $25. Leo F. Caputroni, 1221 Chapel St., New Haven, archt. CD 5/26.

Fla., Bartow—Polk Co. Bd. Pub. Instruction, Bartow, school. George Lee Kramer, P. O. Box 643, Winter Haven, archt.

Ga., Decatur—DeKalb Co., Decatur 3 story, county office bldg. Plans deposit, $30. Rothwell & Nash, 206 Roswell St., Marietta, archts. CD 1/25/45—ENR 2/8/45.

Idaho, Moscow—University of Idaho, Moscow, 2nd unit Kirtley Engineering Laboratories, $1400,000. Hummel, Rardison, 416 Weisgerber Bldg. Lewiston, archt. 4/18/47.

●Mass., New Bedford—City of New Bedford Housing Auth., New Bedford, twenty-four 2 story, wood, garden type apartments, incl. 100 units, Hood Park Proj. 200-L, Rockdale Ave., Parker St., and Hathaway Blvd. $1,115,000. Plans deposit $100. Tallman, LaBrode & Rounsevelle, 222 Union St., archts. CD 7/26—ENR 8/5.

Mo., Marshall—State Dpt. P. Health and Welfare, Samuel Marsh, dir., State Office Bldg., Jefferson City, and Fred E. Appleton, dir. Div. P. Bldgs., 100 State Capitol, Jefferson City, 1 and 2 story, 55x66 ft., 36x178 ft. and 30x55 ft., brick, concrete tubercular patients bldg., Missouri State School. Plans deposit $10. Jamieson & Spearl, 1696 Arcade Bldg., 812 Olive St., St. Louis, archts. CD 2/21—ENR 3/3, under LB.

Neb., Strattan—City, diesel unit, auxiliaries, switchboard, foundations, cooling tower, water pumps and piping sys. $82,000. Henninson Eng. Co., Standard Oil Bldg., Omaha, engr.

●†N. J., Trenton—Yards & Docks Annex, Navy Dpt., Arlington, Va., test jet engine plant and plant for pumping water from Delaware River, $22,750,000. Jarrod Bolles, 415 Lexington Ave., New York, N. Y., engrs. CD 6/9.

●†N. J., Trenton—Yards & Docks Annex, Navy Dpt., Arlington, Va., Naval Aeronautical Turbine Laboratory Shop, water treatment plant and boiler house, $2,200,000. Extended date. Frank Grad & Son, 187 Market St., Newark archts. CD 6/6.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., masonry Stephen F. Austin School, remodeling existing school, 2 shops. $200,000. MacKie & Kamtarh, 2713 Ferndale St., archts. CD 2/2/48—ENR 2/19/48.

Wash., Olympia—Schl. Dist. 329, 3 story, 68x566 ft. and 68x147 ft. steel, concrete McKinley school, $450,000. Plans deposit $25. Wohleb & Wohleb, Olympia, and Naramore, Bain, Brady & Johanson, Dexter Horton Bldg., Seattle, Zone 4, archts. CD 11/22/44—ENR 12/14/44.

About July 1

Kan., Arkansas City—City, City Hall, hospital. $650,000. Wm. T. Schmitt, 1634 N. W. 10 St., Oklahoma City, Okla., archt. CD 4/20—ENR 5/12.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, troop housing and related facilities, Serial No. Eng—29-005-49-99, approx. 3 mi. south of U. S. Hy. 66 and 8 mi. southeast of here Bernalillo Co.

Tenn., Shelbyville—Bedford Co., hospital, $600,000. Charles H. McCauley, Jackson Bldg., Birmingham, Ala., archt.

July 1

Ind., Winchester — Bd. Comrs. Randolph Co., Court House, 2 story, bsmt., brick, rein.-con. steel county hospital, $300,000. Plans deposit $25. Hamilton & Graham, 411 Western Reserve Bldg., Muncie, archts.; Bevington, Taggart & Fowler, 730 Indiana Pythian Bldg., Indianapolis, mech. engrs CD 9/18/47—ENR 10/2/47.

Kan., Overland Park—Bd. Educ., School Dist. 38, J. R. Morris, secy., Overland Park, 1 story, 58x360 ft. 15 room, concrete masonry school. Everett L. Peterson & Conrad J. Curtis, 1163 Armour Blvd., Kansas City, Mo., archts. CD 2/25—ENR 3/17.

Minn., Olivia—Reville Co., C. A. Strom, aud., Olivia, W. M. Wiersma, clk., 2 story, 40x145 ft. Renville Co. Hospital, $250,000. Plans deposit $25. Extended date. C. H. Buetow, 599 N. Snelling Ave., St. Paul, archt. CD 6/8.

Ore., Medford—Jackson Co. Courthouse, 50 bed hospital for county farm near Talent. Plans deposit $30. W. Laing, U. S. National Bank Bldg., archt. CD 7/6/45—ENR 7/26/45.

†Washington—Bonneville Power Admin., 79 N. E. Oregon St., Portland, 8, Ore., construct operators residences and garages at Midway substation, ¼ mi. east of Vernita, Grant Co., Inv. 4684. Plans deposit $10.

After July 1

N. J., Woodstown—Pikesgrove Twp. School Dist., Woodstown, school addn. $300,000. Corcoran & Mills, 234 W. Market St., West Chester, Pa., archts. CD 10/6/48.

July 5

†Fla., Jacksonville—Postmasters Office, P. O. Inspector, U. S. R. Morgan, Federal Bldg., 201x226 ft., 44,505 sq. ft. garage incl. underground storage for 3,000 gal. gasoline, workshop facilities.

N. H., Walpole — Town, Hubbard Farms office, 2 story brick, Consolidated School-High and Elementary School, $275,000. Plans deposit $25. CD 5/10—ENR 6/3.

July 6

Fla., Coral Gables—Dade Co. Bd. Pub. Instruction, c/o August Geiger, archt., 730 Lincoln Lane, Miami Beach, high school. Approx. $250,000. Plans deposit $45. CD 10/7/46—ENR 10/17/46.

La., Ruston—Lincoln Parish Policy Jury, Ruston, 3 story, rein-con., brick, limestone courthouse. $600,000. Plans deposit $25. Extended date Neild & Soniat, Texas Eastern Bldg., Shreveport, archts. CD 2/28—ENR 3/10.

†N. M., Albuquerque—U. S. Eng., P. O. Box 1538, troop housing and related facilities. Serial No. Eng.-29-005-49-99. CD 5/24—ENR 5/26.

N. Y., Brooklyn—Supt. School Bldgs., Design & Construction, 49 Flatbush Ave. exten., Zone 1, general contract plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for P. S. 44, Throop Ave. between Monroe and Madison Sts. Plans deposit $12 for general, $5 plumbing and drainage, $7 heating and ventilating, $6 lighting fixtures. CD 1/25/43—ENR 1/28/43.

N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 7, foundations and general contract, heating and ventilating, electrical work, plumbing for Sect. 1, consisting of Bldgs. 4 to 10 (inclusive) of Farragut Houses (Proj. No. NYS-29) in area bounded by Sands, Bridge, York and Navy Sts. Plans deposit $75. CD 5/10/46—ENR 7/11/46.

Tex., Fort Worth—City, Ed. P. Williams, bus mgr., Fort Worth Pub. Schools, 1 story, masonry, concrete, Riverside Junior High School, Riverside Dr. $400,000. Plans deposit $25. Joe R. Pulich, Comm., Standard Bldg., archt. CD 11/24—ENR 12/23.

Calif., El Centro—City, City Hall, 2 story 22,000 sq. ft. city hall, $400,000. Plans deposit $10. J. F. Golden, 1461 Main St., El Centro, engr. CD 2/21.

Calif., Pasadena — Pasadena City School Dist., 351 S. Hudson Ave., Jefferson Ranch School, $440,000. Plans deposit $25. R. H. Ainsworth, 1199 E. Walnut Ave., Pasadena, archt. R. W. Ware, 1199 E. Walnut Ave., engr.

Calif., Stockton—State Div. Architecture, P. Wks. Bldg., Sacramento, rein.-con. auditorium and chapel at Stockton State Hospital. Plans deposit $25. Anson Boyd, Sacramento, state archt. CD 2/28/45—ENR 3/8/45.

N. D., Grand Forks—State Bd. Higher Educ., Bismarck, student union bldg. at North Dakota State University. $500,000. Gross & Anderson, Grand Forks, archts. CD 5/4—ENR 5/12.

†South Dakota—Bureau Reclamation, Dpt. Interior, Leamon, erecting 2 seven car garages and chain link fence for Shadehill Government Camp, Missouri River Basin Proj., Grand Div., Spec. R6-29 (Region 6).

August 18

●†**Ia., Iowa City**—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., Veterans Admin. general medical hospital, incl. main hospital, garage, laundry, apartment, appurtenant facilities, etc., 12 acre site south of U. S. 6, east of Woolf Ave. and north of Newton Rd. Approx. $8,000,000. CD 4/19/48.

Bids Asked

Conn., Danbury—Danbury Housing Auth., Danbury, 26 duplex and 10 single houses, Liberty Ave., $780,000. Frank La Cava & Walter Campbell, 248 Main St., archts. CD 1/28—ENR 2/17.

W. Va., Charleston—Memorial Hospital Assn. of Charleston, Security Bldg., 7 story main bldg., 100x130 ft. center unit, two 3 story 94x50 ft. wings, Memorial Hospital, Tucker & Sillings, Masonic Temple, archts. Samuel Hannaford & Sons, Dixie Terminal Bldg., Cincinnati, O., consult archts. CD 4/6—ENR 4/21.

LOW BIDDERS

●†**Ariz., Phoenix**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., June 15, 200 bed hospital, for Veterans Admin., Vermont Ave., between B and I Sts., N. W., Wash. 25, D. C., from Del E. Webb Constr. Co., 5101 San Fernando Rd., Los Angeles, Calif., **$3,467,000.** CD 4/19.

Calif., Los Angeles—Bd. Educ., 1425 S. San Pedro St., June 15, 5 rein.-con. Wilmington Area Junior High School bldgs., from Barnett Corp., 5655 Wilshire Blvd., **$992,700.** CD 5/23.

●**Calif., Richmond**—City, City Hall, June 6, 3 story, 107,734 sq. ft. floor area, rein.-con. auditorium and art center, Civic Center with balcony on 3 sides of interior to seat 3700 persons, from Leo Epp, Inc., 317 Broderick St., San Francisco, **$1,888,677.** CD 5/11—ENR 5/19.

Conn., Berlin—Town, Bd. Educ., Berlin, June 3, brick, concrete, steel high school, Patterson Rd. between Farmington Ave. and Lower Lane, from Associated Constr. Co., 1010 Wethersfield Ave., Hartford, **$924,000.** Est. $700,000. CD 5/5—ENR 5/26.

●†**D. C., Wash.**—Pub. Bldgs. Admin., F St. between 18 and 19 Sts. N. W., Womens Dormitories 4 and 5, extens., remodeling existing adjoining bldgs. at Howard University Appr. No. 74-0x24, Proj. No. 49-105, SA-AE, from Cramer-Vollmerhausen Co., Inc., 2601 Connecticut Ave. N. W., **$1,331,000. F. W. A.** CD 5/6.

Ga., Atlanta—City, City Hall, June 13, Carnegie Library addn., from Chas. Bell & Bell, 664 Spring St. N. W., **$733,825.** CD 5/17.

Ill., Chicago—Chicago Housing Auth., 343 S. Dearborn St., June 7, 7 story, brick, rein.con. housing incl. 126 dwelling units, Site 5, Sacramento and Harrison Sts., from George Sollitt Constr. Co., 109 N. Dearborn St. **$963,000.** CD 5/16—ENR 5/26.

†**Kan., Fort Leavenworth**—U. S. Eng., 1709 Jackson St., Omaha, Neb., June 7, printing plant, utilities, etc., Serial No. Eng. 25-066-49-220, from J. E. Dunn Constr. Co., 924 Holmes St., Kansas City, Mo. **$794,891.** CD 4/21—ENR 6/2.

●**La., Shreveport**—State Div. Admin., Baton Rouge, June 8, 10 story Confederate Memorial Medical Center, from J. A. Jones Constr. Co., 755 Gladstone Blvd., **$6,029,000.** CD 4/8—ENR 4/14.

Mass., Greenfield—Town of Greenfield Housing Auth., Town Hall, June 8, 72 unit veterans housing, from William Cushman & Son, Inc., 31 Federal St., **$763,333.** CD 5/25—ENR 6/2.

Minn., Minneapolis—University of Minnesota, R. S. Callaway hitch, agr., 723 Administration bldg., Main Campus, Minneapolis, June 7, general contract field house alterations, incl. ice rink and equip., from Hagstrom Constr. Co., 1567 Selby Ave., St. Paul, **$634,800.** CD 5/19—ENR 6/2.

●†**N. M., Albuquerque** — Veterans Admin., Munitions Bldg., Wash. 25, D. C., June 7, tuberculosis hospital, from Peter Kiewit & Sons Co., 1950 S. Colorado Blvd., Denver, Colo., **$2,919,000.** CD 3/25—ENR 3/31.

†**N. M., Albuquerque**—U. S. Eng., P. O. Box 1538, June 7, AFC family housing, Sandia Base, Serial No. Eng-291-49-94, Stage IV, 83 residences, from R. J. Daum Constr. Co., Albuquerque, **$818,624.**

N. Y., Valley Stream—Bd. Educ., Union Free School Dist. 30, Valley Stream, June 14, school, from Edward Corning Co., 294 E. 39 St., New York, Zone 16, **$559,000.** CD 6/2.

†**Okla., Fort Sill**—U. S. Eng., P. O. Box 61, Tulsa, Zone 2, June 10, Family Quarters Facilities D, Inv. No. Eng-34-066-49-118, from J. W. Bateson Constr. Co., 1102 Irwin-Keasler Bldg., Proposals **(1) $633,222 (2) $737,772 (3) $538,609.** CD 6/3.

●**Ore., Portland**—School Dist. 1, 631 N. E. Clackamas St., June 9, 1 story, 185x667 ft. rein.-con. Lents School and 1 story, 185x667 ft., rein.-con. Binnsmead School from Donald M. Drake Co., Lewis Bldg., **$1,078,500.** CD 5/18—ENR 5/26.

●**Pa., Bradford**—Bradford Hospital Assoc., Bradford, June 1, irregular dimensions, brick, steel hospital, from Ertle Constr. Co., 5 and Market Sts., Camden, N. J. **$1,247,500.** CD 5/12.

●**R. I., Kingstown**—State and Providence Plantations, F. A. Adams, purch. agt., State House, Providence, June 10, chemistry bldg., Proj. 9160, R. I. State College, South Kingston, from Rowley Constr. Co., 230 Central Ave., Pawtucket, **$1,009,900.** CD 5/12—ENR 5/19.

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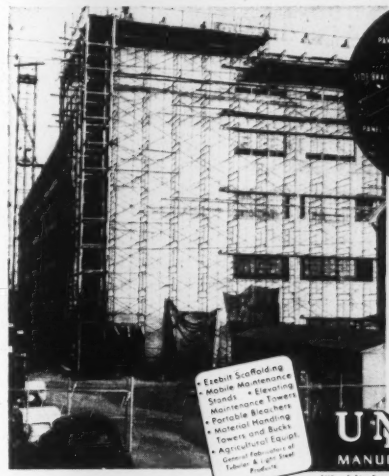
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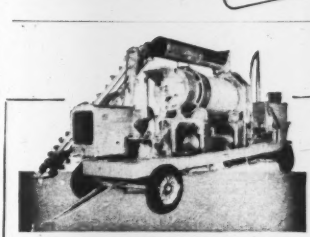

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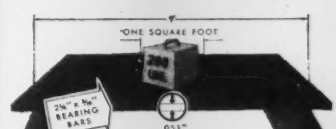

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R. I., Warwick—Bd. Trustees, Kent Co. Hospital, Warwick, June 8, hospital, from Rowley Constr. Co., 290 Central Ave., Pawtucket, **$741,600.** CD 5/19—ENR 6/2.

●†Tenn., Oak Ridge—U. S. Atomic Energy Comm., P. O. Box 368, June 15, high school with 1,500 seat auditorium, Inv. No. 490-19-11A, from John A. Johnson & Sons, Inc., 270 41 St., Brooklyn, N. Y., **$2,490,734.** CD 4/4.

Tex., Kilgore—City, Roy Laird, mayor, June 6, 50 bed city hospital, from Henry C. Bennett, 1315 Cadiz St., Dallas, **$722,155.** CD 5/9—ENR 5/26.

Tex., Lubbock — Lubbock Co., Courthouse, June 15, 1 story, steel courthouse, from W. G. McMillan, Lubbock, **$833,293.** CD 5/18.

Tex., Tyler—Smith Co., Ned Price, judge, Courthouse, June 7, hospital, from Campbell & Kay, P. O. Box 836, **$852,265.** CD 5/10—ENR 5/12.

†Wash., Fort Lewis—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, June 14, family quarters, Serial No. Eng-49-108-49-164, from Tacoma Constr. & Eng. Co., S 32 and G Sts., Tacoma, Schedule A, **$973,500.** Est. **$1,332,320.** CD 5/24.

Wis., Jefferson — Jefferson Co., Jefferson, May 31, general contract 5 story, 92x182 ft. courthouse, from Peter Hamlin Constr. Co., 9 S. Clinton St., Chicago, Ill., **$961,300.** CD 5/17—ENR 5/19.

CONTRACTS AWARDED

†Calif., Inyokern — U. S. Navy, Inyokern, Bldgs. 97 and 98, Spec. 21235, to Haddock Engineers, Ltd., P. O. Box 399, Montebello **$747,263.** Bids 5/10, awarded 6/7. CD 7/23 48.

●†Calif., Point Loma (Sta. San Diego)—U. S. Navy, 1220 Pacific Hy., San Diego, laboratory and supply bldg., at Navy Electronics Laboratory, to Trojte Constr. Co., 2001 Kettner Blvd., San Diego, **$1,965,000.** Bids 5/23. CD 6/1—ENR 6/9, under LB.

Calif., San Bernardino—San Bernardino Co., Courthouse, 2 story, 3,000 sq. ft. rein.-con. tuberculosis ward county hospital addn., to Harvey A. Nickels, 826 E. Slauson Ave., Los Angeles, **$769,878.** Bids 6/1. CD 5/12—ENR 5/26.

●†D. C., Wash.—Pub. Bldgs. Admin., Federal Wks. Bldg., 7 story, limestone, granite federal court bldgs., Constitution Ave., John Marshall Pl. 3 and C Sts. N.W. to Charles H. Tompkins Co., 907 16 St. N.W. **$9,388,686.** Bids 5/24, awarded 5/10. CD 5/6, under LB.

Ga., Thomaston—Upson Co., Thomaston, hospital, to S. J. Curry & Co., Albany, **$869,770.** Bids 5/26. CD 6/1.

●Ill., Blue Island—Community High School Dist. 218, Blue Island, general contract 2 story, brick, steel concrete high school, to Joseph J. Duffy Co., 4994 N. Elston St., Chicago, Approx. **$1,409,890.** CD 5/4.

●Mass., Fitchburg—City of Fitchburg Housing Auth., Fitchburg, general contract 160 unit veterans housing, to E. Perini & Sons, Inc., 73 Montwait Ave., Framingham, **$1,349,633.** Bids 5/18, awarded 6/8. CD 5/25—ENR 6/2, under LB.

Mass., Lowell—City, City Hall, Bartlett School, Wannamaker and Clare Sts., to Nodjie Constr. Co., 54 Eastern Ave., Malden, **$907,949.** Bids 5/12, awarded 6/8. CD 5/20—ENR 5/26, under LB.

Mass., Westboro — Commonwealth of Massachusetts, Dpt. Mental Health, 100 Nashua St., Boston, power plant, State Hospital, PM 36 Contr. 1, to Foley Abrams Corp., 2 Elm Pl., Boston, **$633,000.** Bids 5/20, awarded 6/10. CD 5/31—ENR 6/9, under LB.

●N. Y., Binghamton—Dpt. Mental Hygiene, Albany, general contract 780-bed medical-surgical bldg., at Binghamton State Hospital, to Mutual Constr. Corp., 7 E. 42 St., New York, **$5,263,470.** Bids 4/13. CD 4/18—ENR 4/24, under LB.

●N. Y., Brooklyn—New York City Housing Auth., 63 Park Row, New York, Zone 7, general contract Boulevard Houses Proj. No. NYC-16 in area bounded by Linden Blvd., Ashford St., Wortman Ave., Hendrix St., Stanley and Sutter Aves., to George E. Brase Co. & Maccia Constr. Corp., 11 E. 42 St., New York, Zone 17, **$7,315,731*****heating and ventilating, to Afco Eng. Corp., 331 Vanderbilt Ave., Zone 5, **$873,583*****plumbing, to Jesse E. Kaim, 131 W. 33 St., New York, Zone 11, **$1,006,180.** Grand total $9,195,794. Bids 5/17. CD 5/19, under LB.

●N. Y., New York—New York City Housing Auth., 63 Park Row, Zone 7, foundations, appurtenances for Marble Hill Houses, Proj. No. NYC-15 in area bounded by Broadway, Exterior St., W. 225 St., Broadway, W. 228 St., Marble Hill Ave., W. 230 St., to John Rosenblum, Inc., 1841 Broadway, Zone 23, **$1,856,494.** Bids 5/17. CD 5/19, under LB.

N. Y., New York—Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general contract P. S. 81 addn., Riverdale Ave. between W. 255 and W. 256 Sts., to Maran Constr. Co., Inc., 1910 Arthur Ave., Zone 57, **$807,000.** Bids 4/26. CD 5/2, under LB.

●N. Y., New York—New York City Housing Auth., 63 Park Row, Zone 7, general contract and foundations for Colonial Park Houses

Proj. No. NYC-6 bounded by Harlem River Dr., Polo Grounds, Harlem River Driveways, to H. R. H. Constr. Corp., 9 E. 40 St., Zone 17, **$6,195,000*****plumbing, to Eugene Duklauer, Inc., 215 E. 38 St., Zone 16, **$804,444*****heating and ventilating, to Heating Maintenance Corp., 220 E. 138 St., Zone 51, **$636,600.** Grand total $7,636,044. Bids 5/11. CD 5/16, under LB.

N. D., Fargo—Bd. Educ., Fargo, Junior High School, to Meinecke-Johnson Co., Fargo, **$771,000.** Bids 5/27. CD 6/9—ENR 6/16, under LB.

●+Wis., Madison—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., 10 story brick, reinf.-con. veterans hospital, for Veterans Admin., Vermont Ave. between H and I Sts. N. W., Wash., D. C., to Gust K. Newberg Constr. Co., 2940 N. Ashland Ave., Chicago, Ill., **$7,111,-000.** Bids 5/26. CD 6/2, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

June 27

Mass., Worcester—State Mutual Life Insurance Co., 340 Main St., Main office and annex bldg alterations. $250,000. Johnson, Rustigian & Kunz, 390 Main St., archts.

Que., Montreal—J. A. Dutrisac, archt., 1069 Beatty Ave., Verdun, 55x150 ft., reinf.-con., steel, stone church, for Roman Catholic Parish of St. Philippe de Apiestle, 7 Belanger St. $250,000. CD 5/29/47—ENR 6/12/47.

June 28

La., Destrahan—St. Charles Roman Catholic Church, Destrahan, 2 story, 40x60 ft., brick, tile convent. Wm. R. Burk, Pan American Bldg., New Orleans, archt.

N. C., Rockingham—Southern Bell Telephone & Telegraph Co., Hurt Bldg., Atlanta, Ga., dial and toll office. Shutze & Armistead, Candler Bldg., Atlanta, Ga., archts.

●O., Cleveland—Federal Department Store, 444 Willis St., Detroit, Mich., 1 story, bsmnt., 200x250 ft. department store and paving at Brookpark and Pearl Rds. $1,000,000. Charles N. Agree, 1140 Boone Bldg., Detroit, Mich., archt.

Tex., Austin—Country Club of Austin Building Corp., F. Reeves, pres., c/o Page, Southerland & Page, archts., 602 West Ave., club proper remodeling, expan., 18 hole golf course, rein.-con. pool, etc. $300,000. CD 3/29—ENR 4/7.

August 15

●Tex., El Paso—Providence Memorial Hospital Dr. L. L. Evans, Dist. Supt., 617 Santa Fe St., 6 story, bsmnt., 200 bed steel frame Memorial Hospital and Nurses Home, concrete pier and beam fdn. $1,000,000. Carroll & Daeuble, 1001 E. Yandell Blvd., archts. Cancelled bids to have been opened Apr. 19. CD 3/15—ENR 3/17.

Bids Asked

●Tex., Corpus Christi—Orville W. Eastland, Jones Bldg., 35 stucco and steel type apartments of 4 to 8 units each, concrete slab fdns. in Claire Lane Gardens on Ayres St. $1,500,000. E. Dexter Hanson, Med. Professional Bldg., archt. F. T. Drought, 117 E. Pecan St., San Antonio, structural engr. H. L. Guess, Jr., 2424 St. Stapleton St., electrical engr. H. Bartholomew & Assoc. 317 N. 11 St. St. Louis, Mo., and H. D. Thompson, 3216 Santa Fe St., landscape archts. CD 3/16—ENR 3/31.

Wis., Kenosha—St. Marks Catholic Congregation, 5114 14 Ave., 2 story, bsmnt. 128x142 ft., steel, brick, block school and rectory addn., concrete fdn. and floors. H. R. Slaby, 2750 N. Teutonia Ave., Zone 6, Milwaukee, archt.

Wis., West Allis—Carmelite Sisters of the Divine Heart of Jesus, 7377 S. 52 St., Zone 14, 3 story, bsmnt., Z-shaped 115x234 ft., steel, brick, tile old People's Home addn., concrete fdn. floors. E. Brielmaier & Sons Co., 735 N. Water St., Milwaukee, Zone 2, archts.

SOON LETS CONTRACT

●Calif., Los Angeles—Thomas Hull, c/o Frank Green, archt., 1515 N. Chevy Chase Pl., Glendale, soon lets contract Hollywood Roosevelt Hotel addn. $2,250,000. CD 4/8.

●Calif., San Mateo—M. J. Ryan, 149 Montgomery St., San Francisco, soon lets contract 10½ story, 165-unit apartment, $1,200,000. Angus McSweeney, 415 Mission St., San Francisco, archt. CD 7/23/48.

Tex., Dallas—Great American Reserve Life Insurance Co., 715 Park St., soon lets contract 4 story, bsmnt., 40,000 sq. ft. face brick, steel office. $600,000. George L. Dahl, 2101 N. St. Paul St., archt. CD 6/2—ENR 6/9.

Tex., San Antonio—Alamo Realty Corp., c/o Albert Steves, III, 716 E. Commerce St., soon lets contract 138 apartment unit brick veneer, Belmeade Apartments, concrete slab fdn. Hathaways Dr. in Belmeade Addn. Glenn C. Wilson, 1510 Majestic Bldg., archt. Frisch T. Drought, 117 W. Pecan St., structural engr. Otto Phillips, 9051/2 W. Jefferson St., landscape archt. CD 3/3—ENR 3/10, under CA.

LOW BIDDERS

●Ala., Birmingham—Crippled Children's Clinic, 2430 11 Ave. N. June 7, 100 bed orthopedic hospital, from Day & Richardson, 429 24 St. S., Birmingham. **$1,335,800.** CD 5/3—ENR 5/13.

Ala., Birmingham — St. Vincents Hospital, c/o Charles H. McCauley, archt., Jackson Bldg., rejected bids June 2, hospital addn. L.B. **$989,740.** Will readvertise. CD 6/8.

La., New Orleans—St. Charles Ave. Presbyterian Church, c/o low bidder, educational bldg., from Keller Constr. Corp., 7900 Palm St., **$270,000.**

Mich., Saginaw—St. Luke Hospital, 2300 Mershon St., 2 story, bsmnt., brick, stone, concrete hospital, from Spence Bros., 415 McCoskry St., **$982,690.** CD 3/3—ENR 3/17.

N. Y., Bayshore—Southside Hospital, Montauk Hy., June 10, hospital addn., from Fred T. Ley Co., 280 Park Ave., New York, Zone 1. **$738,000.** CD 6/2—ENR 6/9.

N. C., High Point—High Point Memorial Hospital, Inc., High Point, June 10, hospital, from J. A. Jones Const. Co., 209 W. 4 St., Charlotte. **$569,800.** CD 5/19—ENR 5/26.

CONTRACTS AWARDED

Ala., Montgomery—St. Jude Hospital, Montgomery, general contract hospital and equip., to Beers Constr. Co., 70 Ellis St. N.E., Atlanta, Ga. **$974,302.** Bids 6/1. CD 6/8—ENR 6/16, under LB.

Conn., New Milford—New Milford Hospital, Inc., 21 Elm St., J. F. Bresnahan, pres. Bd. Trustees, 2 story, brick, steel concrete hospital, Elm St., to E. & F. Constr. Co., 94 Wells St., Bridgeport. **$532,752.** CD 6/1—ENR 6/9.

●Ga., Savannah — Chatham City Corp., c/o contractor, 100 housing units, to Byck-Worrell Constr. Co., E. Bay St. Approx. **$1,000,000.**

●Ill., Chicago—St. Rita Parish Church, 2712 W. 63 St., 3 story, bsmnt., steel, stone church, to James McHugh Constr. Co., 6449 S. Park St. **$1,000,000.** A. F. Moratz & Co., Bloomington, archt.

●Md., Baltimore—College Gardens Corp., 11 E. Fayette St., two hundred forty-eight 2 story, brick, cinder block dwellings, 4200 and 4300 blocks Parkton St., 4200 and 4300 blocks Maudville Rd., 600, 500 and 600 blocks Yale Ave., to The Delwood Co., 11 E. Fayette St., **$2,163,000.** Lawrence A. Menefee, 347 N. Charles St., archt.

●Minn., St. Louis Park—Donovan Constr. Co., 1725 Carroll Ave., St. Paul, apartment. Owner builds. **$5,100,000.**

Neb., Omaha—St. Cecelia Parish, 40 and Burt Sts., general contract Cathedral High School, to Parsons Constr. Co., Grain Exchange Bldg., **$500,000.** Bids 6/7. CD 5/16/46.

N. J., Lindenwold—Johnson Quality Homes, Inc., Pemberton, residential development, White Horse Pike, separate contracts. **$760,-000.** Hettel & Albert, 501 Cooper St., Camden, archts.

●N. J., New Milford—Joseph J. Brunetti Constr. Co., 100 Essex St., Maywood, 2000 apartment housing on former Heine and Ferdinand farm tracks. Owner builds. **$16,000,000.** Leonard G. Feinen, 320 Lincoln Ave., Hasbrouck Heights, archt.

N. Y., Babylon—Nair Assoc., c/o Albert E. Schaefer, archt., 427 Fifth Ave., New York, Zone 17, 65 one-family houses, known as Shore Park Homes, Virginia and Fire Island Aves. Owner builds. **$500,000.**

N. Y., Brooklyn—100 Remsen Street, Inc., 521 Fifth Ave., New York, 8 story apartment, 100-106 Remsen Ave. Owner builds. **$700,000.** CD 3/23—ENR 4/7.

●N. Y., Manhasset — Wheatley Acres, c/o Matern & York, archts. 90-04 161 St., Jamaica, 270 houses on site of Shelter Rock Golf Course. Owner builds. **$3,000,000.**

N. Y., Ossining—Syndicate, Anton Schnapp, pres., c/o H. I. Feldman, 415 Lexington Ave., New York, Zone 17, 79 family garden apartment, Pierson Gardens, on S. Highland Ave. Owner builds. **$400,000.**

●N. Y., Scarsdale—Kenilworth Gardens, Inc., c/o S. J. Kessler & Sons, archts., 118 E. 28 St., New York, Zone 16, 6 story apartment, Garth Rd., to K. & L. Constr. Co., 118 E. 28 St., New York, Zone 16. **$1,600,000.**

N. Y., White Plains—Hewett Builders, c/o Max M. Simon, archt., 1841 Broadway, New York, Zone 19, 8 family apartment development, Soundview Ave. and White Plains Rd. Owner builds. **$400,000.** CD 8/4.

●O., Granville — Denison University Administration Bldg., Denison Campus, Granville, physical education community center bldg., to A. M. Higley, 2026 E. 22 St., Cleveland. Approx. **$1,500,000.** Bids 5/18. CD 5/19.

O., Parma—Z. & W. Constr. Co., 13484 Cedar Ave., Cleveland Heights, sixty-nine 1½ story bsmnt. frame residences, Lincoln, Tuxedo, W. 44, Kenmore, W. 54, Russell, Wood, W. 50 Sts. separate contracts. **$650,000.** CD 5/13.

●Pa., Bryn Athyn — Academy of The New Church, Bryn Athyn, school, to John McShain, Inc., 17 and Spring Garden Sts., Phila. **$1,000,000.** Bids 5/24. CD 5/12.

Pa., Phila.—Mariana & Himelfarb, 5424 Euclid Ave., residential development, Tyson St., separate contracts. **$710,000.** I. W. Levin, 1531 Belmont Ave., archt.

Pa., Phila.—Martino Constr. Co., Inc., 2235 Tasker St., residential development, 26 and 27 Sts., separate contracts. **$638,100.** Anthony P. Macaluso, 2628 S. 17 St., archt.

Pa., Phila. — John M. Zerby, 8533 Forrest Ave., residential development, Saul St., separate contracts. **$560,000.**

Tex., Dallas—Lewis & Lamberth, 3728 Mt. Ranier St., 200 masonry residences in Community Housing Proj. Owner builds. **$900,000.** CD 3/3/48.

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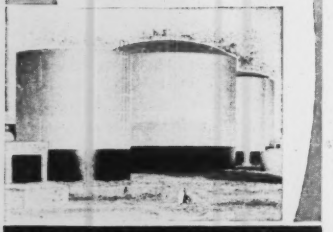

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Tex., Dallas — Herman Louput, c/o Westmoreland Village, 203 N. Burnet St., masonry commercial bldg. units, Fort Worth Hy. Own forces. Approx. **$350,000.** CD 3/14—ENR 3/17.

●**Tex., Dallas**—Moody & Tips, 701 Forest Ave. Rd., 300 addnl. dwellings, Illinois and Overton Sts. Owner builds. **$1,800,000.** CD 3/3—ENR 3/17.

●**Ont., Billings Bridge** — Berthiaume Realty Co., 18 Rideau St., Ottawa, 250 houses, west side Medcalf Hy., between southern limits, Billings Bridge, and Heron Rd., own forces. Approx. **$1,300,000.** Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, archts. CD 10/16/46.

INDUSTRIAL BUILDINGS

BIDS ASKED

June 27

Ont., Etobicoke—PLANT—J. B. Parkin & Assoc., archts., 648 Church St., Toronto, 2 story, 25x110 ft., concrete, steel, brick plant for Faberge Perfumes Canada Ltd., 630 W. King St., Toronto. Plans deposit $25. CD 3/9.

Bids Asked

Conn., Bridgeport—LAUNDRY, etc.—Savoy Laundry & Linen Supply Co., 861 Hallett St., 1 and 2 story, part bsmnt., 65x250 ft., brick, steel laundry and office. Main St. $70,000. H. E. Koerner, 83 Fairfield Ave., archt.

Pa., Phila.—STORE HOUSE—Pennsylvania R. R., L. P. Struble, ch. engr. (Eastern Region) Broad St. Station Bldg., 1617 Pennsylvania Blvd., Zone 4, 1 story, bsmnt., 50x275 ft. concrete storehouse. $200,000. George Wharton Pepper, Jr., Lewis Tower Bldg., archt. CD 2/28.

LOW BIDDERS

Calif., Oakland—FACTORY—Longview Fibre Co., 1 Montgomery St., San Francisco, brick factory, to Wagner & Martinez, 181 S. Park St., San Francisco. Approx. **$320,000.** Hall & Pregnoff, 251 Kearny St., San Francisco, engrs.

CONTRACTS AWARDED

Calif., Corcoran—WAREHOUSE, etc.—Salyer Farms, 900 Whitley St., 120x300 ft., reinf.-con., steel warehouse and bulk storage plant, to Berlinger Constr. Co., Box 716, Chico. Approx. **$500,000.**

Fla., Palatka—WAREHOUSE—The Hudson Pulp & Paper Corp., 2 story, concrete warehouse at existing plant near here, on St. Johns River. Owner builds. **$500,000.** CD 2/6/46—ENR 2/14/46.

Ill., Chicago—WAREHOUSE—Illinois Bell Telephone Co., 212 W. Washington St., Zone 3, warehouse, 225 S. Wells St., to W. E. O'Neil Constr. Co., 2151 N. Clybourne St., Zone 14. Approx. **$450,000.** Awarded 6/6. Holabird Root & Burgee, 180 N. Wabash St., Zone 1, archts.

●**Ind., Gary**—PLANT—Carnegie Illinois Steel Co., Gary Tin Works plant exten., to E. H. McGraw & Co., 58 E. Washington St., Chicago, 1 Ill. Approx. **$1,000,000.** Wean Eng. Co., Youngstown, O., archt.

●**Ia., Des Moines**—PLANT—Iowa Plant Food Mfg. Co., 300 Farm Bureau Bldg., design and construction plaster bldg., John J. Harte Co., Forsyth Bldg., Atlanta, Ga. Approx. **$1,000,000.**

Mich., Detroit—FERMENTING CELLARS—Goebel Brewing Co., 2001 Rivard St., 2 floor addn. to stock and fermenting cellars, Plant 3, to Hatton-Mahon Co., 2631 Woodward Ave., Approx. **$400,000.** Harley, Ellington & Day, 153 E. Elizabeth St., Zone 26, archts.

Tenn., Memphis—FACTORY—Massey-Harris Co., c/o Hanker & Heyer, archts., Commerce Title Bldg., general contract farm implements plant, to Building Constructors, Inc., Dermon Bldg., Approx. **$500,000.**

●**Tex., Dallas**—PLANT—Eastman Kodak Co., 343 State St., Rochester, N. Y., 3 story, 60,000 sq. ft. plant, air-conditioning, to Henry C. Beck, 1295 Irwin-Keasler Bldg., Dallas. **$1,259,382.** Est. $750,000. Bids 5/17. CD 6/3.

●**Tex., Freeport**—INDUSTRIAL—Dow Chemical Co., Freeport, industrial bldg., to Tellepsen Constr. Co., 3900 Clay St., Houston. **$1,000,000.** CD 6/3.

Tex., San Diego — REFINERY — Coast Oil Corp., San Diego, gasoline refinery, own forces. Approx. **$800,000.** CD 4/4/48.

Tex., Sterligson (Alice P. O.)—PLANT—Humble Oil & Refining Co., 1216 Main St., Houston, gas injection plant, own forces. Approx **$975,000.** CD 7/14/48.

Wis., Milwaukee—GRAIN STORAGE BINS —Frederick Grain & Malting Co., 3830 W. Grant St., Zone 7, 80x270 ft. concrete grain storage bins, to Klug & Smith Co., 4425 W. Mitchell St., Zone 14. Approx. **$400,000.**

●**Wyo., Worland**—PLANT—Texas Gulf Sulphur Co., United States Natl. Bank Bldg., Galveston, Tex., design and construction gas treating plant and sulphur recovery plant, to The Girdler Corp., 224 E. Broadway, Louisville 1, Ky. Est. **$3,000,000.** CD 8/16—ENR 8/26.

UNCLASSIFIED

BIDS ASKED

June 27

Connecticut—FERRY SLIPS TERMINALS—State, G. Albert Hill, hy. comr., Hartford, constructing Ferry Slips terminals Chester and Lyme, 40 ft. surf. treated gravel approaches, Lime, 175 ft. surf. treated gravel approaches in Chester.

N. J., Newark—PNEUMATIC TUBE SYSTEM—At Office Chief Engineer, Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., furnishing, installing pneumatic tube sys. in Newark Motor Truck Terminal, Contr. NJT-8. Plans deposit $10.

June 28

N. C., Concord—ELECTRICAL DISTRIBUTION—Office Supt. Rd. Light & Water Comrs., Concord, inquiry electrical distr. sys. Plans deposit $50. B. O. Vannort Engineers, Inc., 218 W. 2 St., Charlotte, engr.

On or About June 29

†Minn., Fort Snelling—CEMETERY IMPRVS. —U. S. Eng. 1709 Jackson St., Omaha 2, Neb., seeding at Fort Snelling National Cemetery, Serial No. Eng. 25-066-49-286.

June 29

B. C. Sandspit—WHARF—J. M. Somerville, secy., c/o owner, Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf renewal at Sandspit, Skidegate Inlet, Moresby Island. Approx. $75,000. Plans deposit $20. R. Blais, c/o owner, engr.

Que., Mechins—WHARF—J. M. Somerville, secy., c/o Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf exten., Approx. $250,000. Plans deposit $20. R. Blais, c/o owner, engr.

June 30

Mass., Stoneham—SWIMMING POOL, etc.—Commonwealth of Mass., Metropolitan Dist. Comrs., 20 Somerset St., Boston, swimming pool and bath house, $100,000. Plans deposit $5.

Missouri—RURAL DISTRIBUTION LINES —Consolidated Electric Co-operative, Inc., Leo R. Heer, pres., 217 W. Jackson St., Mexico, 242 mi. rural distr. lines, Audrain, Montgomery and Pike Counties, Proj Mshourt 36 P&S, Audrain. Plans deposit $25. Bitzenbaum & Smith, 3868 Cote Brilliante Ave., St. Louis, Zone 12, engrs. CD 11/10—ENR 11/18.

Missouri—RURAL DISTRIBUTION LINES—Northeast Electric Power Co-operative, Palmyra, 125 mi. 69 KV rural distr. lines, 9 substations, Marion Co. Approx. $200,000. Stanley Eng. Co., Hershey Bldg., Muscatine, Ia., engr.

Texas — RURAL DISTRIBUTION LINES — Concho Valley Electric Co-operative, Inc., San Angelo, 150 mi. rural distr. lines, Concho, Tom Green, Nolan, Coke, Sterling and Mitchell Counties, $165,000. Plans deposit $15. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. CD 10/15/47—ENR 10/30/47.

N. S., St. Peters—WHARF—F. T. Collins, c/o Dpt. Transport, Hunter Bldg., Ottawa, Ont., rehabilitation wharf and bank, west side of Atlantic or southerly entrance and part of stone filled timber cribwork and bank east side of lake or northerly entrance to St. Peters Canal, Cape Breton Island. Approx. $60,000. Plans deposit $10. CD 9/30/43.

July 1

La., Hammond—UTILITIES—At office A. Hays Town, archt., Masonic Bldg., Baton Rouge, Dist. 6 Headquarters Offices, Shops, Water Well and Distr. Sys., for Louisiana Dpt. Highways, Baton Rouge. Plans deposit $25.

Bids Asked

Del., Georgetown — RACE TRACK — Delmarva Raceway, Inc., E. Laurel St., Georgetown, harness race track. $225,000. CD 4/14—ENR 5/12.

Ont., Swansea—PARK and PLAYGROUND—Municipality, park and playground, $55,000. Hanks & Irwin, 2448 W. Bloor St., Toronto, archt. G. A. MacDonald, 15 Morningside Dr., Toronto, engr.

LOW BIDDERS

Ala., Mobile—WHARF—State Docks Comn., Mobile, wharf exten., from Byrd & Bruns Bridge Co., 817 Chartres St., New Orleans, La., **$289,906.**

La., Breaux Bridge—NATURAL GAS SYSTEM—Town, Town Hall, June 7, natural gas sys., incl. transmission line and distr. lines, from Sterling Co., P. O. Box 957, Shreveport, steel pipe **$128,489,** c. i. pipe **$157,284.** CD 5/26—ENR 5/26.

†Md., Camp Detrick — CLOUD STUDY CHAMBER—U. S. Eng. First and Douglas Sts. N. W., Wash., 25, D. C., June 7, cloud study chambers addns., air conditioning, from Poole & Kent, 2322 N. Charles St., Baltimore, **$84,000.** CD 5/20—ENR 6/2.

†Montana—OUTDOOR SUBSTATION—U. S. Eng., Fort Peck, June 8, outdoor substation addn., incl. grading, excav., refilling, gravel blanket for outdoor substation, switchyard, underground conduits, etc., Serial No. Eng. 24-016-49-70, from Elliott Constr. Co., Sunderland Bldg., Omaha, Neb., **$237,818,** Est. $329,078.

New York—DC CONNECTIONS, etc.—Bd. Transportation, 250 Hudson St., New York, Zone 13, N. Y., May 27, furnishing, installing DC connections and track bonding for Rue D-Hillside Ave. Exten. from 178 to 184 Pl., Queens Boro, from Utility Electric Co., Inc., 92 Liberty St., New York, Zone 6, **$138,000.** CD 5/12—ENR 5/19.

N. Y., Forest Hills—PLAYGROUND—Dpt. Parks, Arsenal Bldg., 64 St. and 5 Ave., New York Zone 21, June 14, playground between 78 and 77 Aves., from Austin St. to Long Island R.R., Queens Boro, Contr. No. Q-304-149, from Northeastern Chemical Co., 564 Jackson Ave., New York, **$105,000.** CD 6/8.

●**†Oregon**—RAILROAD RELOCATION—U. S. Engr., 628 Pittock Block, Portland, June 14, relocate S. P. R. R., stations 1515 to 1655 and

Hy. 58, stations 201 to 342, Lookout Point Dam at Meridian Dam Site, from Utah Constr. Co., 4 Montgomery St., San Francisco, Calif., **$1,178,057.** CD 4/26.

†Oregon — SALMON HATCHERY — U. S. Eng., Pittock Block, Portland, Zone 5, June 7, salmon hatchery, ice plant, refrigeration sys., 3 residences with garages, power plant, electrical sys. at Marion Forks, 17 mi. east of Detroit, Eng-35-026-49-508, Marion Co., from Gaasland Constr. Co., Bellingham, Wash., **$310,622.** Est. $394,592. CD 5/26.

†Washington—TRANSMISSION LINE—Bonneville Power Admin., 729 N. E. Oregon St., Portland, 8, Ore., June 7, 77 mi. Columbia-Grand Coulee 3, 230 kv. transmission line, Douglas, Grant and Okanogan Counties, Inv. 4632, from Abbett Constr. Co., 742 Tehama St., San Francisco, Calif., **$753,017.** CD 5/25.

†Washington—STEEL TOWER LINE—Bonneville Power Admin., 729 N. E. Oregon St., Portland 8, Ore., June 8, constructing 5.4 mi. Grand Coulee-Snohomish East Switchyard extn. 230 kv steel tower line, Okanogan and Douglas Counties, Inv. 4640, from Montgomery Electric Co., 2375 N. W. Thurman St., Portland, Ore., **$181,535.** CD 5/25.

●Wash., Seattle — GENERATORS — City, County-City Bldg., Zone 4, June 8, three 100,000 kva. generators for Ross Dam Power Plant, from Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa., **$4,145,222.** Est. $3,000,000. CD 4/21—ENR 4/28.

Wis., Green Bay—SWIMMING POOLS, etc.—Bd. Park Comrs., 409 E. Walnut St., May 31, general contract 2 swimming pools and bathhouses, from H. J. Bishop & Son, 702 Garden St., **$109,425***** plumbing, from George F. Reeke, Inc., Green Bay **$121,479.** CD 5/25.

CONTRACTS AWARDED

Iowa—RURAL DISTRIBUTION LINES—Buchanan County Rural Electric Co-operative, Independence, rural distr. lines, Buchanan Co., and vicinity, force account, Approx. **$240,000.** CD 4/1—ENR 4/28.

Minnesota—RURAL DISTRIBUTION LINES—Mille Lacs Region Co-operative Power & Light Assn., Aitkin, 159 mi. rural electr. distr. lines, Aitkin, Mille Lacs and Crow Wing Counties, to G. B. Determan & Son, Melrose, **$179,288.** Bids 5/27. CD 5/17.

Minnesota—RURAL DISTRIBUTION LINES—Minnesota Valley Co-operative Light & Power Assn., Montevideo, 302 mi. rural distr. lines, Chippewa, Lyon, Yellow Medicine, Redwood, Lac du Parle and Renville Counties, to McGraw Constr. Co., Middletown, O., **$371,079.** Bids 5/17. CD 5/12.

Mo., Columbia—GYMNASIUM—Curators of University of Missouri, Leslie, Cowan, vice pres., Jesse Hall, general contract 1 story bsmnt., 98x110 ft. addn., alterations to Rothwell Gymnasium, to McCarthy Bros. Constr. Co., 4903 Delmar Blvd., St. Louis, Zone 8, **$230,145.** Bids 6/7. CD 5/31.

North Dakota — RURAL DISTRIBUTION LINES—James Valley Electric Co-operative, Edgeley, rural distr. lines, Sect. D-1, 469 mi. to Boswell-Cusach Constr. Co., Sioux City, Ia., **$473,243;** Sect. D-2, 439 mi., to Hallett Constr. Co., Crosby, Minn., **$433,621.** Bids 5/25. CD 5/19.

●†Tenn., Oak Ridge—SITE DEVELOPMENT—U. S. Atomic Energy Comn., P. O. Box 365, June 15, site development on 108 acre tract, incl. clearing, grading, construct basic roads, parking areas and utilities for new shopping center, Inv. No. 491-49-12A, from Ralph E. Mills Co., Inc., 410 Ann St., Frankfort, Ky., **$1,124,179.** CD 5/16.

Tex., Houston — TRANSMISSION LINES—Houston Lighting & Power Co., 1016 Walker St., addnl. electric transmission lines, force account, **$400,000.**

Wis., Milwaukee—SERVICE BLDG.—Forest Home Cemetery, 2405 W. Forest Home Ave., Zone 4, 1½ story, 34x137 ft., brick, steel, service bldg. addn., block fdn., concrete floor, to Selzer-Ornst Co., 6222 W. State St., Wauwatosa, Zone 13. Est. **$120,000.** Fitzhugh Scott, 724 E. Mason St., Zone 2, archt.

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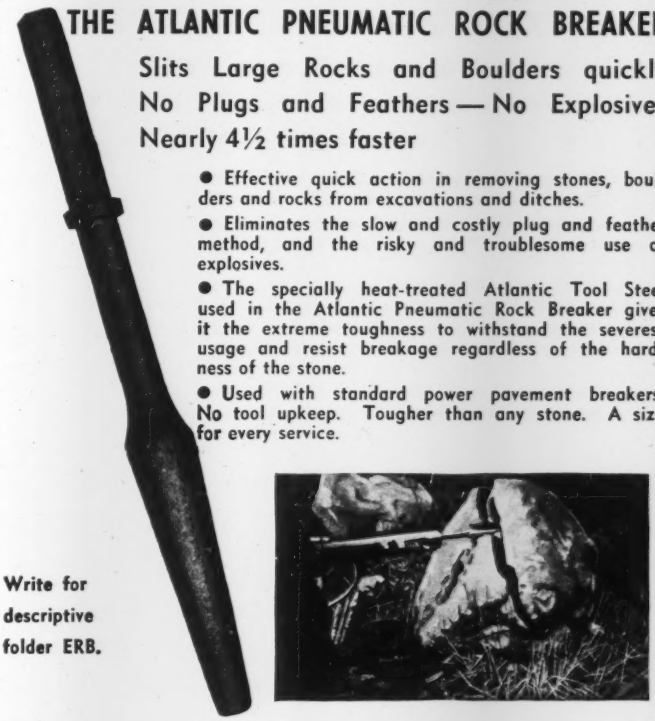

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CONSTRUCTION REPORTS—Third Section

WATER SUPPLY

BIDS ASKED

July 5

La., Sulphur—Town, c/o Mayor, Town Hall, drilling deep well, pump installation.

July 15

Tenn., Tiptonville—City, E. E. Lobo, mayor, WW improv. incl. extens., improv. to water treatment plant, 2 new filters addn., erator, settling basin, rehabilitating 2 filters, incl. sewers 5,000 ft 8- to 15-in. pipe manholes, etc. Russell & Axon, 408 Olive St., St. Louis, Mo., engrs.

July 19

Mo., St. Louis—City, c/o Frank J. McDevitt, pres. Bd. of Service, 304 City Hall, Zone 3, cleaning, repairing lining 62 in. Conduit 1, between Stacey Park Reservoir and Station 60 plus 00, between Westwood Dr., St. Louis Co., and Hampton Ave. $82,200. Plans deposit $15. Dpt. P. Utilities, Thomas J. Skinker, water comr., 312 City Hall, 12 and Market Sts., St. Louis, Zone 3, engr. CD 6/23/44.

July 28

O., Christiansburg—Village, Contr. R, water distr. sys. and elevated storage. Approx. $28,000. Plans deposit $10. Alden E. Stilson & Assoc., 709 S. High St., engr.

LOW BIDDERS

Minn., Duluth—City, C. D. Jerohimus, clk., City Hall, June 19, reservoir, Arlington and Allen Aves., from A. A. Bodin & Sons, 802 Garfield Ave., **$28,193**, reservoir, Minneapolis Ave and Mankato St., from Polaris Concrete Products Co., 8010 Medina St., **$108,237.**

N. J., Camden—Bd. Educ., Municipal Bldg., water lines at Burroughs Junior High School, from Fred W. Schump, Inc., 42 Van Hook St., **$28,012.** William T. Harker, 307 **Market** St., engr., CD 5/18/46.

Pa., Philadelphia—Dpt. P. Wks., City Hall Annex, June 15, watermains, Friendship St., etc., WWI-427, from M. & J. B. McHugh, 892 N. Markoe St., **$222,953*****Welsh Rd., etc., WWI-151, from Kelly Paving Co., 6002 Stenton Ave., **$51,115****Clover St., WWI-418, from Conduit & Foundation Corp., 770 S. Schuylkill Ave., **$28,719*****Baltimore Ave., etc., WWI-428, from D. & C. Spinoso Co., 2 N. Jerome St., Allentown, **$68,666.** CD 6/2.

Tex., Hereford—City, W. E. Dameron, mgr., June 14, approx. 18,000 lin. ft. 6- to 10-in. waterlines, from Enix Constr. Co., Plainview, **$42,000.** Est. $45,000. Parkhill, Smith & Cooper, 1006-14 St., Lubbock, engrs.

CONTRACTS AWARDED

Ky., Cave City—City, City Hall, water distr. sys., to Ruby Constr. Co., Madisonville, **$92,-305.** Bids 6/8. CD 5/23.

SEWERS, WASTE DISPOSAL

BIDS ASKED

June 30

Ky., Mt. Sterling—City, City Hall, sanitary sewerage sys., addns., J. S. Watkins, 145 E. High St., Lexington, engr.

July 5

Miss., Durant—City, City Hall, sanitary sewer improv. Plans deposit $10. Abbott Eng. Co., Greenwood, Miss., engr.

July 6

Ark., Nashville—City, sewage treatment plant, intercepting sewer, etc. Plans deposit $20. Charles O. Thomas, Hope, engr.

Calif., Los Angeles—City, P. Bd. Wks., 153 City Hall, sanitary sewers in Myra Ave. Relief Sewer Dist., 2, approx. $50,000. Lloyd Aldrich, engr.

Minn., Aurora—Village, A. Smolich, recdr., Aurora, sanitary sewers, sewage disposal plant, Sanitary Sewer Dist. 3. $50,000. Plans deposit $20. E. F. Johnson, Virginia, engr. CD 8/4, under LB.

July 11

Minn., St. Louis Park—Village, J. Justad, clk., Village Hall, sanitary lateral sewers, for Sanitary Sewer Dists. 20, 21, and 1B, $60,000. W. C. Litton, village engr.

LOW BIDDERS

Calif., Visalia—City, City Hall, rejected bids May 17, sewage treatment plant addn., L. R. **$97,570.** CD 5/7.

D. C., Wash.—Distr. Comrs., District Bldg., June 16, storm water and sanitary sewers between New York Ave. and W. St. vicinity of 15 St. N. E. from Square Constr. Co., 115 S. Haven St., Baltimore, Md., **$74,155.** CD 6/9.

La., Shreveport—City, City Hall, June 11, incinerator bldg. addn., Kings Hy., from Rife Constr. Co., 2608 Inwood St., Dallas, Tex., **$231,374.** CD 5/17.

Md., Baltimore—Mayor & City Council, City Hall, June 17, Settlings Pond No. 6, Back River Sewage Treatment Wks., Sanitary Constr. 396, from John Matricciani & Co., Inc., 409 S. Caroline St., Baltimore, **$274,666.** CD 6/6.

Ore., Lebanon—City, City Hall, June 10, 24,000 lin. ft. storm sewer from P. S. Lord, 1507 S. E. Milwaukie St., Portland, **$70,231.** CD 6/2.

Tex., Hereford—City, June 14, approx. 36,-000 lin. ft. 6-to 10-in. sanitary sewers, manholes, cleanouts, appurtenances, from Enix Constr. Co., Plainview, **$56,853.** Est. $75,000. Parkhill, Smith & Cooper, 1006-14 St., Lubbock, engrs.

CONTRACTS AWARDED

Kan., Olathe—Mission Twp., Olathe, sanitary sewers, to Brosnahan & Sieben, 1805 Grand St., Kansas City, Mo., **$83,443.** Bids 5/27. Payne & Brockway, Olathe, engrs. CD 5/18.

Mo., Sedalia—City, J. M. Bailey, clk., City Hall, Contr. 6, bldg. and structures, North Sewage Plants, Contr. 7, bldg. and structures, West Plant, to Lippert Bros. Constr. Co., 2800 N. Santa Fe St., Oklahoma City, Okla., **$245,360.** Bids 5/31. CD 5/18.

Tex., Fort Worth—City, City Hall, sanitary sewer line repairs, replacements, **$100,000;** storm sewer line repairing and replacements, **$115,000,** force account. CD 2/4.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

June 27	**July 1**
Connecticut	**Kansas**
June 28	**Minnesota**
Maryland	**Washington**
North Carolina	**July 6**
June 29	**Delaware**
Louisiana	**July 8**
June 30	**Pennsylvania**
New Jersey	**July 12**
	Maryland

July 14
Maryland

June 29

†Georgia—C. S. Eng., P. O. Box 1169, Mobile 7, Ala., bridge over Etowah River, Cherokee Co., Serial No. Eng-01-076-49-146.

LOW BIDDERS

Louisiana—State Hy. Dpt., Baton Rouge, June 15, creosoted timber trestle span Lake Bistineau Bridge, grav. 1,463 mi approaches, State Rt. 1154, S. P. 30-03-04, Bienville and Bossier Parishes, from Newsom Bros., Columbia, Miss., **$102,810.** CD 5/18.

New Jersey—Spencer Miller, Jr., State hy. comr., State Hy. Dpt., Trenton, Palisades Avenue Bridge over Ravine Rd., Jersey City, F.A.S.P. S-124 (3), Hudson Co., from James Morrell, 24 Montgomery St., Jersey City, **$112,773.** CD 6/1.

Pennsylvania—State Hy. Dpt., Harrisburg, June 17, 3 I-beam bridges over tributary of Lion Creek and Lion Creek proper, 0.47 mi. bit. surf. on crushed aggregate base, L.R. 23059 (1), Lehigh Co. from Wright Griffin, Le Raysville, **$92,464*****I-beam bridge, bit. surf. and crushed aggregate base 1,393 ft. over Jordan Creek, L.R. 23023 (2) T.R. 329, Lehigh Co., from Charles Riebe, Lansford, **$115,297*****reconstruct steel truss bridge superstructure, bit. surf. on crushed aggregate base, 894 ft. over Red Bank Creek in village of Maxport, L. R. 357 Sec. R-1, T. R. 536, Clarion and Armstrong Counties, from Carl J. Jacobsen, Erie, **$51,927****** I-beam bridges and bit. surf. crushed aggregate base over Hummer Creek, Shirley Run, Maddy and Thompson Creeks, 3,441 ft. L. R. 20050 (1 Br. 20104 (3Br), 20105 (1 Br. 20120 (1Br, TR 88, 289, 408, Crawford Co., from New Castle Dunble Co., New Castle, **$179,353.** CD 5/26.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

June 27	**July 1**
Connecticut	**Kansas**
June 28	**Minnesota**
Maryland	**Washington**
Massachusetts	**July 6**
North Carolina	**Delaware**
June 29	**July 7**
Louisiana	**New Jersey**
Maine	**July 8**
	Pennsylvania

July 13
Delaware

June 27

†Md., Edgewood—U. S. Eng., First and Douglas Sts. N. W., Wash., 25, D. C., resurf. roads, Army Chemical Center, Serial No. Eng. 49-000-49-206 (59)M.

June 29

Md., Baltimore—Mayor & City Council, City Hall, c. conc. Contr. 298, sheet asph. resurf. streets, Contr. 930, bit. conc. surf. pave streets, Contr. 992; c. conc. paving streets, Contr. 993; concrete curbs, gutters, street paving, Contr. 995. Plans deposit $5 each. J. H. McKay, hy. engr. CD 11/20/46.

Pa., Phila.—Dpt. P. Wks., City Hall Annex, paving Kenyon St., etc. Approx. $50,000. Dudley T. Corning, Highways Chief. CD 1/30/44.

July 1

Calif., Sacramento—City, City Hall, imprv. streets in Fruitridge Oaks Unit 1. Approx. $50,000. Plans deposit $10. Fred Klaus, City Hall, city engr. CD 11/12/45.

July 5

Calif., San Mateo—City, City Hall, imprv. W. 20 Ave., etc., Res. 49-A. Approx. $50,000. Plans deposit $10. Arthur B. Sullivan, City Hall, city engr.

July 6

Tex., Wharton—Wharton Co. Courthouse, Wharton, 26.9 mi. grading, drainage structures, flexible base, asph. surf. tr. Precinct 3. $208,000. Plans deposit $25. McCormick & Teller, 2711 Grant St., engrs. CD 5/27.

July 11

Minn., St. Paul—Hennepin Co., R. E. Fitzsimmons, aud., grading, paving, 2.3 mi. between Trunk Hy. 110 at Mound and 2.3 mi. east, incl. 15,373 cu. yd. excav., 31,840 sq. yd. concrete pavement, S. P. 27-561-03 (SAR 7 and 15) Minn., Proj. S 22 (3), $100,000. Plans deposit $1.10. L. P. Zimmerman, co. hy. engr. CD 9/15/43.

July 12

Calif., Fresno—State Div. Architecture, P. Wks. Bldg., Sacramento, landscaping, paving and 2 comfort stations, for 21st District Agricultural Assn. Anson Boyd, state archt.

July 13

La., Metairie—Jefferson Parish Police Jury, Metairie, street paving. Plans deposit $20. S. V. Applewhite, 424 Millandon St., New Orleans, engr.

Bids Asked

O., Toledo—Comrs. Lucas Co. Courthouse, repave Cherry St. from Central Ave. to Collingswood Blvd. $70,000. Melvin Rice, co. engr. CD 5/24/48.

California—State Div. Hys., Sacramento, c. conc. on cement treated subgrade, plant mix on crushed run surf. 7.5 mi. between 1 mi. south of Tipton & Tulare Airport, Tulare Co., to N. M. Ball Sons, Box 130, Berkeley, **$633,229.** Bids 5/25. CD 6/2, under LB.

Idaho—State Hy. Dpt., Boise, resurf. 10.269 mi. seal coating 10.989 mi. North South Hy. between Winchester Junction and Idaho Co. line, Idaho Co., to Canyon Constr. Co., Caldwell, **$148,799** est. $162,610; reconditioning road bed, bit. surf. 10.174 mi. Nez Perce-Kamiah River north, Lemhi Co., to Holmes Constr. Co., Heyburn, **$116,985** est. $112,035.

†Oregon—Pub. Roads Admin., Broadway and Oak Bldg., Portland, surf. 21 mi. Willamette Hy. 43 mi. east of Eugene, Proj. 21-E-1, G3, H4, J3, K5, L2. Lane Co., to Peter Kiewit Sons Co., Box 491, Longview, Wash., **$618,289.** Bids 5/26, awarded 6/14. CD 6/1, under LB.

Ore., Portland—Multnomah Co., Courthouse, grading, paving Cornell Rd. to K. F. Jacobsen Co., 0.445 S. W. Porter St., **$65,083.** Awarded 6/16. George Buck, c/o owner, engr.

Tex., Alice—Southwestern American Homes, Alice, asph. street paving, grading, drainage, own forces. Approx. **$50,000.**

Tex., Fort Worth—City, City Hall, street reconditioning and resurf., various, sects. city, federal aid. **$90,000.** CD 10/11/45.

Ont., Cornwall—Cornwall Twp., V. A. McDonald, R. R. 1, Mille Roches, permanent pavements, to Dibblee Constr. Co., Ltd., 248 Albert St., Ottawa. Approx. **$107,954.** CD 4/26.

CONTRACTS AWARDED

Calif., Pasadena—City, 100 N. Garfield Ave., June 13, imprv. Foothill Blvd. from Santa Anita Ave. to Sierra Madre Villa, from T. E. Sherlock, 1103 W. 49 Pl., Los Angeles, **$189,-861.** CD 5/31.

Louisiana—State Hy. Dpt., Baton Rouge, June 15, grading, reinforced concrete girder bridges, soil cement, base course 11.082 mi. Bayou Rodeau Hy., State Rt. 70, F.A.S.P. S. 70 S. P. 83-04-05, Bossier Parish, from T. R. Tomlinson Jr., Doyline, **$443,396.** CD 5/27*** stabilize, drainage structures, base course, bit. surf. 3.629 mi. Winnesboro-Fort Necessitta Hy. State Rt. 17, F. A. S. P. S. 237, (2) S. P. 36-02-03, Franklin Parish, from C. J. & J. M. Keilen, Columbia, **$143,363.** CD 5/25*** grading, shaping, drainage structures, bit. surf. tr. 9.299 mi. timber bridge, Springhill-Shongaloo Hy. State Rt. 7 (3), S. P. 43-02-06, Webster Parish, from M. E. Pollard, Bossier City, **$189,417.** CD 5/26*** bit. surf. on St. Francisville-Jackson Hy., State Rt. 5, S. P. 61-04-13, F. A. S. P. S. 205 (3) West Feliciana Parish, from W. H. Patterson & Co., Arthur Standard Heights, Baton Rouge, **$192,514,** CD 6/6.

Maryland—State Hy. Dpt., Baltimore, June 8, furnishing, del., applying b. conc. 3.466 mi. Spec. B. along State Rt. 36, beginning at southern town limits, Laconing and extending southerly to Barton Allehany Co., from Cumberland Contg. Co., Cumberland, **$156,313.** CD 6/3.

†**Washington**—Pub. Rds. Admin., Broadway-Oak Bldg., Portland, Ore., June 16, surf. 7 mi. Mt. Adams Hy., Guler S., Proj. 17-B5, Klickitat Co., from J. N. & M. J. Conley, 4432 N. E. Royal Court, Portland, Ore., **$134,027**; grading 1.6 mi. Randle-Yakima Hy., Proj. 13-Z1, Unit 5, Lewis Co., from Hugh Govan, Box 308, Port Angeles, **$240,188**. CD 6/8.

EARTHWORK, WATERWAYS

BIDS ASKED

June 27

N. J., Atlantic City—N. J. State Dpt. Conservation & Economic Development, State House Annex, Trenton, 5 jetties. $200,000. George R. Swinton, city engr. CD 5/2.

June 28

†**Missouri**—U. S. Eng., Clock Tower Bldg., Rock Island, Ill., upper approach dike, Lock and Dam 22, Mississippi River, Ralls Co., approx. 1 mi. downstream from Saverton, Serial No. Eng. 11-117-49-84.

July 1

†**Washington**—U. S. Eng., 19 E. Poplar St., Walla Walla, design, furnish., install., test sluice gates for Mill Creek Flood Control Proj., Serial No. Eng-45-164-49-112.

July 6

N. S., Hampton—J. M. Somerville, secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater repairs. Approx. $83,000. Plans deposit $20. R. Blais, c/o owner, engr.

July 7

Pa., Birdsboro—State Water & Power Resources Bd., Harrisburg, silt impounding basin. Approx. $150,000. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.

Pa., Doughassville—Penna. Water & Power Resources Bd., Harrisburg, silt impounding basin. Approx. $150,000. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.

Pa., Middle Abrams—State Dpt. Water & Power Resources Bd., Harrisburg, silt impounding basin. Approx. $150,000. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.

Pa., Norristown—Penna. Water & Power Resources Bd., Harrisburg, silt impounding basin. Approx. $150,000. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.

July 8

†**Louisiana**—U. S. Eng., foot Prytania St., New Orleans, approx. 870,000 cu. yd. hydraulic earthwork, or 985,000 cu. yd. uncompacted type 31 earthwork, enlargement East Atchafalya Basin Protection Levee, Serial No. Eng. 49-350.

July 12

†**Wyoming**—Bureau Reclamation, Dpt. Interior, Casper, furnishing, del. equip. for control board and battery charger and furnishing services of an erecting engineer for new Casper Substation, Kendrick Proj.; adv. ENR 6/30.

July 14

†**Nebraska-Kansas**—Bureau Reclamation, Dpt. Interior, Superior, earthwork, concrete canal lining, structures Station 1 plus 87.3 to Station 772 plus 00, Courtland Canal, Bostwick Div., Missouri Basin Proj., on south of the Republican River in vicinity of Guide Rock and Superior, Spec. No. 2707.

About July 16

†**Illinois**—U. S. Eng., 826 U. S. Court House & Custom House, 1114 Market St., St. Louis, Zone 1, Mo., repair and enlargement levees, Big Swan Drainage and Levee Dist. Item 3, Scott Co., involving, approx. 4,120 lin. ft. earthwork levee along north bank Sandy Creek, mile 56 above mouth of Illinois River, incl. 28,000 cu. yd. levee embankment, 6 acres seeding, mulching.

July 19

†**South Dakota**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Lemmon, one 8x6 ft. slide gate, one slide gate hoist and one semi-automatic gate hanger for outlet works at Shadehill Dam, Grand Division, Missouri River Basin Proj. Spec. 2713.

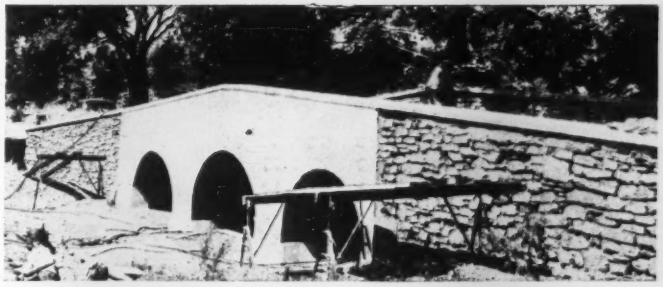
August 2

Pennsylvania—Dpt. Forests & Waters, Education Bldg., Harrisburg, Conte. 20 dredging Broadway clearing and excavation in River Sect. V. of Schuylkill River. Plans deposit $50. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs., adv. ENR 6/30.

LOW BIDDERS

†**Illinois**—U. S. Eng., 826 U. S. Court House & Custom House, St. Louis, I. Mo., June 17, levees, left bank Mississippi River, Columbia Drainage and Levee Dist., Proj. Item LL-B, Monroe Co., Serial No. Eng., 23-066-49-137 from Elsworth Constr. & Equip. Co., 7031 Manchester Ave., St. Louis, 17, Mo. **$66,374**. CD 6/3.

Proposal Advertisements see pp. 125 to 128
Proposed Projects see p. 97



"GUNITE" MAKES OLD STONE BRIDGE SAFE

This small arched bridge belonging to the Pennsylvania State Highway Department was rebuilt to safe strength for normal traffic with "GUNITE". Loose mortar was cleaned from all joints and "GUNITE" was applied to repoint the masonry, line the arch barrel and reinforce the end walls. After this photo was taken the stone masonry approach walls were also repointed and "GUNITED".

This and many other practical repairs to existing structures have been made with "GUNITE" and are illustrated and described in our new Bulletin A2400. A request on your letterhead will bring you your copy.

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"GUNITE" CONTRACTORS
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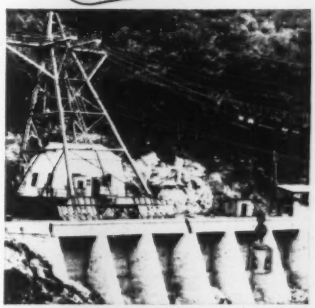

Illustration shows Sauerman Tautline Cableway working on huge Chastang Dam. Two identical machines with spans of 1146 ft., conveying speeds of 1300 f.p.m., handle all the materials going into this dam. Mixed concrete is handled in 8 cu. yd. dump buckets; other materials in skips and slings.

Operating OVER the working area—never interfering with other operations, a Sauerman Tautline Cableway quickly, efficiently and economically hoists, conveys, and places any material at any spot within its span.

However, not all jobs are as big as the one pictured at left; many Sauerman Tautlines can be seen on bridge and other construction jobs. A simple, inexpensive 2-ton machine often handles all the materials used in construction, taking the place of derricks and cranes, and completely eliminating dump cars, concrete buggies or spouting systems.

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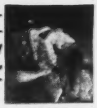

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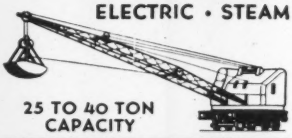

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THE OHIO LOCOMOTIVE CRANE CO.

BUCYRUS, OHIO

OFFICIAL PROPOSALS

Bids: July 11, 1949 (187)

Water Softening Plant

6 MGD NEW WATER SOFTENING PLANT
HURON, SOUTH DAKOTA

Sealed proposals for furnishing all labor, materials, equipment and constructing a New Water Softening Plant will be received by the Board of Commissioners, Huron, South Dakota, until 2:00 PM (CST) on the 11th day of July 1949 and then publicly opened and read.

The work covers the furnishing of labor and materials and equipment installed and constructing the complete New 6 MGD Water Softening Plant, requiring approximately:

PART I
Excavation 9,500 Cu Yds
Concrete Substructure 2,500 Cu Yds
Superstructure, Brick, or Steel or Concrete Blks, 1 and 2 Stories 114 ft x 182 ft
Plant Piping & Valves 30 Tons

PART II
HS Motor Pumps 2
Lime Equipment—Bins, Elevator, Chutes, Slaker, Feeders, Filter Equipment for 3—1½ MGD Units,
Razing & Altering Old Filter Bldg.
LS Pump Station, altered & 3 New Motor-Pumps, Piping & Valves
River Intake, Structure & Pipe Line
Yard Work, HS Main & Ventr. Meter, Wash Sewer & Sanit. Sewer.

Each proposal shall be accompanied by a Cashier Check or Certified Check on a South Dakota Bank as a guarantee of entering into the Specified Contract and furnishing a 100% Performance Bond. All proposals must be made on the forms to be furnished by the Owners.

Plans, Specifications, Bond and Contract Forms may be seen at the Auditor's Office, Huron, or at the Consulting Engineer Office, E. H. Dunmire, 2774 South St., Lincoln, Nebraska or copies of Plans, Specifications, Bidding Forms etc. may be obtained from the Consulting Engineer by the deposit of $50.00, of which, $10.00 will be returned for each set of documents returned at the time of the Letting.

Payment for the work will be made monthly, in cash, on the Engineer's Estimates.

City reserves the right to reject any or all bids, or Item Bids in Part II.

J. S. Tschetter, Mayor
W. H. Olson, Auditor
E. H. Dunmire, Consit. Engr.
Lincoln, Nebraska

Bids: July 7, 1949 (211)

Construction of Parkway

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 4 PARKWAY, SECTIONS 5B & 6C
Construction of Route 4 Parkway, Sections 5B and 6C, Paving, from Inman Avenue to Centennial Avenue, in Woodbridge, Clark, Linden, Cranford and Winfield Townships, Middlesex and Union Counties. Federal Project U-188(11). Length 3.417 miles.

Estimated:
36,290 cu. yds. Roadway Excavation—Earth
75,000 cu. yds. Borrow Excavation
55,000 sq. yds. Macadam Base Course,—4"&5"
19,000 sq. yds. 3" Mod. Pen. Macadam Inter. Course
31,000 sq. yds. 3" Pen. Mac. Sur. Course —Rough Texture
1,675 tons Bituminous Concrete Pavement
107,000 sq. yds. 8" Plain Conc. Pavement Surface
1,200 sq. yds. Bridge Approach Slabs

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Thursday, July 7, 1949 at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by Sections 2, 3 and 4, P. L. 521, 78th Congress and is to be performed in accordance with the special provisions and requirements of the Federal Works Agency, Public Roads Administration, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, Cor. Maple & Fayette Avenues, Perth Amboy, N. J., and/or 268 N. Broad Street, Elizabeth, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all unskilled labor employed on this contract shall be 65¢ per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be 75¢ per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.25 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: July 13, 1949 (212)

State Road Work

Sealed proposals will be received by the State Highway Department at its offices, Dover, Delaware, until 1:00 P.M., E.S.T. (2:00 P.M., E.D.S.T.) July 13, 1949, and at that time and place publicly opened for contracts involving the following approximate quantities:

CONTRACT 1053
Bituminous Surface Treatment—1949
New Castle County
4,000 Gal. R.C. 1 Asphalt, Furnished and applied
110,000 Gal. R.C. 3 Asphalt, Furnished and applied
47,000 Gal. R.S. 2 Emulsen, Furnished and applied
or 47,000 Gal. R.C. 3 Asphalt, Furnished and applied
46,000 Gal. R.T. 9 Tar, Furnished and applied
or 46,000 Gal. R.C. 3 Asphalt, Furnished and applied
11,000 Tons Crushed Chips, Furnished and applied

CONTRACT 1054
Bituminous Surface Treatment—1949
Kent County
3,200 Gal. R.C. 1 Asphalt, Furnished and applied
115,000 Gal. R.C. 3 Asphalt, Furnished and applied
5,200 Tons Crushed Chips, Furnished and applied

CONTRACT 1055
Bituminous Surface Treatment—1949
Sussex County
7,600 Gal. R.C. 1 Asphalt, Furnished and applied
281,000 Gal. R.C. 3 Asphalt, Furnished and applied
2,500 Tons Stone Chips, Furnished and applied
7,000 Tons Slag Chips, Furnished and applied

Attention called to the Special Provisions in the proposal, specifications and contract agreement.

The Employment Agency for these contracts shall be the Delaware State Employment Service whose offices are located at 601 Shipley Street, Wilmington, Delaware; 307 S. State Street, Dover, and the Wagamon Building, The Circle, Georgetown, Delaware.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed as specified.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check, or money to the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked "Proposal for the construction of State Highway Contract No. ....."

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

The right is reserved to reject any or all bids.

Complete sets of plans and specifications may be obtained after June 27, 1949, upon receipt of five dollars ($5.00) for each contract, which amount will not be refunded.

Make checks payable to the State Highway Department.

STATE HIGHWAY DEPARTMENT
By: J. Gordon Smith, Chairman
W. A. McWilliams, Chief Engineer.
Dover, Delaware
June 15, 1949.

Bids: July 13, 1949 (216)

Pumping Equipment for Fire Pumping Station

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-98

Sealed proposals for furnishing and installing pumping equipment for a fire pumping station at New York International Airport will be received in the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, N. Y., until 2:00 P.M., Wednesday, July 13, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:30 P.M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.
New York, June 23, 1949.

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of Stage No. 3 of Diversion Channel and Upper Iowa River Channel Improvement and Levees, Decorah, Iowa, will be received in this office until 11:00 A.M., C.S.T., June 27, 1949, and then publicly opened. Further information upon application. (199)

(Continued on page 126)

OFFICIAL PROPOSALS

Bids: July 13, 1949 (209)

Postponement of Bids

FOR

ONONDAGA COUNTY WAR MEMORIAL AUDITORIUM

Syracuse, New York

Notice is hereby given that the receiving and opening of bids set for 2 P.M. E.D.T. Wednesday, June 22, 1949, has been postponed until 2 P.M. E.D.T. Wednesday, July 13, 1949, and SEALED PROPOSALS will be received until 2 P.M., E.D.T. Wednesday, July 13, 1949, by R. W. Sollinger, County Purchasing Agent in Room 107 at Court House, Syracuse, N. Y., at which time they will be publicly opened and read in Supervisors Chambers on Fourth Floor, for a multi-purpose auditorium building of 9,000 seating capacity, located in the City of Syracuse, New York.

Proposals will be received separately on General Construction with Arch-rib concrete roof structure; Plumbing; Heating; Ventilation; Refrigeration and Rink Piping; Electrical.

Information for Bidders, Plans and Specifications may be examined in the offices of the County Purchasing Agent, or Edgerton and Edgerton, Architect-Engineer Associates, 401 Herald Building, Syracuse, N. Y., or Syracuse Builders' Exchange, 207 James Street, Syracuse 2, New York. General information pertaining to the design of the concrete arch roof structure may also be obtained from Ammann and Whitney, Consulting Engineers, 76 Ninth Avenue, New York 11, N. Y. Information pertaining to Mechanical and Electrical Work may be obtained from Robson & Woese, Inc., 2030 Erie Blvd. E., Syracuse, New York.

One set of General Construction Drawings and Specifications are obtainable from the County Purchasing Agent by General Contractors by depositing $50.00. One set of each Mechanical or Electrical Drawings and Specifications are obtainable from the County Purchasing Agent by Mechanical or Electrical Contractors by depositing $15.00 for each set. Any sets in addition to the above are obtainable by prime bidders by paying $30.00 per set of General Construction and $10.00 per set for each Mechanical or Electrical. The $50.00 and $15.00 deposit for the initial sets will be refunded upon return of the Drawings and Specifications, in good condition, within one week after bid opening date. The $30.00 and $10.00 payments for additional sets will not be refunded. Other than prime bidders shall buy plans and specifications from the Architect-Engineer without refund.

The right is reserved to reject any and all bids.

Dated, Syracuse, N. Y., June 10, 1949.

ROBERT W. SOLLINGER
County Purchasing Agent
107 Court House
Syracuse, New York

U. S. Government

Public Roads Administration, Federal Works Agency, June 9, 1949. SEALED BIDS will be received at the office of the Public Roads Administration, 214 Globe Building, 4th & Cedar Streets, St. Paul, Minnesota, until 10:00 a.m. C.S.T., JULY 8, 1949, for the construction of Minnesota Forest Highway Project 15-C2, Dt. Lake County, Minnesota. Length—12.681 miles. Approximately 150,000 sq.yd. Road-Mix Surfacing or 10,500 tons Plant-Mix Surfacing, and other work. Minimum wage rate to be paid as fixed as required by law. For plans and specifications, a deposit of $5.00 cash or certified check made payable to the Treasurer of the United States will be required to insure their return within 15 days after the opening of bids. Plans, Specifications and proposal forms may be obtained from the address given above or the office of the Division Engineer, 1449 Columbia Pike, Arlington, Virginia. H. J. Spelman, Division Engineer.

(210)

OFFICIAL PROPOSAL

RATE: $1.00 per line (or fraction) per insertion.

CLOSING DATE: 3:00 p.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

OFFICIAL PROPOSALS

Bids: July 13, 1949 (218)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Chapter 63, Laws of 1936, as amended, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time on Wednesday, July 13, 1949, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, 353 Broadway, Albany 1, N. Y.				
Albany & Schenectady	RC 49-71	Albany-Schenectady, Pts. 1 & 2, S. H. 176, 385 Schenectady-Albany A. H. 179	7.42	Resurface Striking of Curbing	$250 Plans $5	$4,300
		DISTRICT No. 2				
		LACY KETCHUM, 109 No. Genesee St., Utica 1, N. Y.				
Oneida & Herkimer	RC 49-69	Rome-Floyd, Pt. 1, S.H. 47-6; Pt. 2 Fash 47-8 Rome-Holland Patent, Pt. 2, S. H. 8345 Poland-Trenton, S. H. 5559	5.03	Roadside Improvement	$1,500 Plans $5	$28,000
		DISTRICT No. 3				
		WILLIAM ROBINSON, Weigh Lock Bldg., Syracuse 1, N. Y.				
Onondaga	OT 49-0 MT 49-1 RC 49-7 Sel 49-12	Ontario Thruway Mohawk Thruway Syracuse-Cicero, S. H. 5470 Le Moyne Avenue	2.65	1.86 mi. 9" Cem. Conc. Pavt. 48'-52' Av., 0.43 mi. Asp. Conc. Opt., 0.36 mi. Gravel Surfacing. Alpha I-B 4 Spans 26' 59', 35' 8", 32' 1". Alpha I-B 4 Spans 2 @ 66' 65.65', 46.25', 44.25'. I-Beam 57' 0" Span. I-Beam 50' Span, Alpha	$80,000 Plans $20	$1,415,000 $139.43
		DISTRICT No. 5				
		C. R. WATERS, State Office Bldg., Buffalo 2, N. Y.				
Chautauqua	RC 49-75	Jamestown-Stockton, Pt. 1, S. H. 1026, Pratt Corners-Sinclairville, S. H. 1471	4.14	4.12 mi. 9" & 9"-8"-9" Two Course Cem. Conc. Pavt. 24' Wide 0.02 mi. Misc. Work Alpha I-Beam 95' C to C span Reinf. Conc. Slab 33.75' span Alpha $88.20	$45,000 Plans $10	$844,000
Chautauqua & Cattaraugus	RC 49-77	Versailles Bridge Cattaraugus Indian Reservation; Onoville Bridge, Quaker Bridge & Vandalia Bridge Allegany Indian Reservation; Westfield Village Viaduct Br. No. 1, S. H. 9046	—	Painting 5 Bridges	$4,000 Plans $5	$70,000
		DISTRICT No. 6				
		H. F. BAUMM, State Office Bldg., Hornell, N. Y.				
Steuben	FAC 49-4 FARC 49-73	Corning City, Denison Parkway Extension Big Flat-Gibson, S. H. 742 Proj. 1-225-7, Proj. F-225-7, Proj. F-342-B	3.32	0.53 mi. Asp. Conc. Type 1A, 2.79 mi. Asp. Conc. Opt.	$ 0,000 Plans $10	$1,031,000
Tioga	RC 49-70	Owego-Candor, Pt. 2, S. H. 9067 5471	0.67	0.41 mi. Asp. Conc. Opt. 0.22 mi. Misc. Work 0.04 mi. 3 sp. I-Beam 80' each, Alpha, $287.49	$13,000 Plans $5	$239,000
		DISTRICT No. 7				
		ROY F. HALL, 444 Van Duzee St., Watertown, N. Y.				
Franklin	RC 49-72	Piercefield-Tupper Lake, Pt. 2 34 A, S. H. 9013 Tupper Lake Village, S. H. 5707	3.34	Asp. Conc. Opt.	$4,000 Plans $5	$72,000
		DISTRICT No. 8				
		J. S. BIXBY, Pleasant Valley Road, Poughkeepsie, N. Y.				
Westchester	CCP 49-1	Cross County Parkway to Hutchinson River Parkway Wartburg Connection)	0.58	8" Cem. Conc. Pavt. 12' & Var. Wide Elliptical Arch. 50' 7½" Span, Conc. Arch. 53' 10" Span Rigid Frame 87' 9" Span	$90,000 Plans $10	$1,650,000
Westchester	PSC 5970	Elimination of Grade Crossing of the N. Y. C. R. R. Co. with Ashford Avenue Dobbs Ferry	0.30	8" Cem. Conc. Pavt. 40' Wide Built up Beam spans 4@5.5' Built up Beam 4 spans 173' Pedestrian Subway under R. R.	$55,000 Plans $20	$981,000
		DISTRICT No. 9				
		F. W. DONOVAN, 71 Frederick St., Binghamton 21F, N. Y.				
Delaware, Sullivan & Wayne, Pa.	RC 49-78	Interstate Bridges Across Delaware River, Hancock-Buckingham Br. No. 10, Lordville-Tapaninik Br. No. 9; Kellam-Stalker Br. No. 8 & Callicoon-Damascus Br. No. 7	—	Painting 4 Bridges	$1,000 Plans $5	$19,800

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated. The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

(Continued on page 127)

U. S. Government
(Continued from page 126)

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La.—Sealed bids will be received in this office until 11:00 a.m., CST, August 2, 1949, and then opened for constructing a 500-bed Veterans Administration Hospital in the city of New Orleans, in the New Orleans District. Further information on application.

(188)

OFFICIAL PROPOSALS

Bids: July 5, 1949 (208)

County Road Work

Bids July 5, 1949, County Road Work, Broome County Highway Department, Binghamton, New York.

Pursuant to the provisions of Article 6, Section 126 of the Highway Law, sealed proposals will be received by the County Superintendent of Highway at the Broome County Highway Office, County Office Building, Binghamton, New York until eleven o'clock Eastern Day Light Saving Time on Tuesday July 5, 1949 for the construction of the following:

West Chenango-East Maine County Roads No. 71 & 73, Project No. 88, 2.4 miles, variable width of roadway, estimate $220,000, deposit required $12,000, minimum wage rate per hour for above work shall be as follows: Labor, $1.50.

Maps, plans, specifications and estimates may be seen, and proposal forms obtained at the office of the County Superintendent of Highways at Binghamton, New York. Copies of maps, plans, specifications, and estimates may be obtained upon deposit of $5.00 for each set, with check payable to the Broome County Highway Department. Special attention of bidders is called to General Information for bidders in the proposals, specifications and contract agreement. Contract proposals must be submitted in a sealed envelope with the name and number of the project plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft, or a certified check payable to the County Treasurer of the County of Broome for the sum as specified in this advertisement.

The retention and disposal of such cash, draft or check by the County of Broome shall conform with Subdivision 2, Section 38 of the Highway Law as amended. The successful bidder will be required to execute the contract and comply in all respects with Section 38 of the Highway Law as amended. The right is reserved to reject any or all bids.

Bids: July 6, 1949 (206)

State Road Work

Sealed proposals will be received by the State Highway Department at its offices, Dover, Delaware, until 1:00 P. M., E.S.T. (2:00 P. M., E.D.S.T.), July 6, 1949 and at that time and place publicly opened for contracts involving the following approximate quantities:

CONTRACT 962
Federal Aid Project F-48 (6)
Cranston Heights to Basin Corner
New Castle County
C. C. Widening & Hot-Mix Asphalt Surface—4.039 Miles

8,000 C.Y. Excavation
20 C.Y. Structure Excavation
15,000 C.Y. Borrow
1,000 C.Y. Borrow Pit Stripping
10,000 C.Y. Selected Borrow
200 Tons W. B. Macadam
2,275 C.Y. C. C. Base
9,000 Tons Hot-Mix Asphalt
590 C.Y. Cement Concrete Pavement
600 S.Y. Patching
71 C.Y. C. C. Masonry
5,300 Lb. Reinforcing Steel
830 Sqs. Wire Mesh Reinforcement
800 L.F. 12" R.C. Pipe
120 L.F. 15" R.C. Pipe
85 L.F. 18" R.C. Pipe
70 L.F. 24" R.C. Pipe
80 L.F. 36" R.C. Pipe
90 L.F. 48" R.C. Pipe
240 L.F. 8" Corr. Metal Pipe
34 L.F. 4" Vit. Clay Pipe
6 L.F. 6" Vit. Clay Pipe
72 L.F. 10" Vit. Clay Pipe
2,750 S.Y. Cement Concrete Gutter
4,100 L.F. Cement Concrete Curb
800 L.F. Integral Curb and Gutter
12,000 S.F. 4" Cement Concrete Sidewalk
12,000 S.F. 4" Cement Concrete Sidewalk
1,100 S.F. 6" Cement Concrete Sidewalk
2,100 L.F. Wood Shoulder Curb
19 Each Catch Basins
10,000 Lb. Castings
1,900 L.F. Wire Rope Guard Fence

OFFICIAL PROPOSALS

6 Each End Post Attachments
320 C.Y. Topsoil
0.5 A. Seeding
4,400 S.Y. Sodding
5,000 Gal. R.C. 1 Asphalt
5,000 Gal. R.C. 3 Asphalt
200 Tons Slag Chips
200 Tons Crushed Chips
6,600 S.Y. Removal Present Pavement
140 Each Removal Trees
1,100 L.F. Reset Guard Rail
43 Each New G. Rail Posts
14 Each Adjusted Catch Basins
17 Each Adjusted Manholes
290 Tons Sand
590 Each Bags Extra Cement
60 L.F. Inlet Curb
350 L.F. Timber Piles

CONTRACT 987
Federal Aid Projects F-64 (1) & 10 (3)
Camp Meeting Woods to Silver Lake
Kent County
C. C. Widening and Hot-Mix Asphalt Surface—3.721 Miles

6,000 C.Y. Excavation
250 C.Y. Borrow Pit Stripping
4,500 C.Y. Selected Borrow
875 C.Y. Cement Concrete Base
12,000 Tons Hot-Mix Asphalt
485 C.Y. Cement Concrete Pavement
600 S.Y. Patching
425 L.F. 12" R.C. Pipe
2,300 L.F. 15" R.C. Pipe
141 L.F. 18" R. C. Pipe
1,755 L.F. 15" Concrete Sewer Pipe
60 L.F. 10" T.C. Pipe
11,250 L.F. Cement Concrete Curb
110 L.F. Parkway Curb
5,000 S.F. 4" Cement Concrete Sidewalk
800 S.F. 6" Cement Concrete Sidewalk
115 L.F. Inlet Curb
35 Each Catch Basins
11 Each Adjusted Catch Basins
23,700 Lb. Castings
650 C.Y. Topsoil
4,400 S.Y. Sodding
80 Tons Quarry Screenings
360 Tons Sand
8 Each Manholes
1.25 A. Seeding
15 Each Trees Removed
500 S.F. Reset Brick Sidewalk
400 Each Bags Extra Cement
2,000 S.Y. Removal Present Pavement
140 S.Y. 6" Cement Concrete Gutter
250 L.F. Wood Shoulder Curb
250 L.F. Wire Rope Guard Rail

CONTRACT 1006
Federal Aid Project S-20 (3)
Wyoming to State Route 8
Kent County
Stabilized Earth and Surface Treated 2.588 Miles

0.8 A. Clearing
1.2 A. Grubbing
12,000 C.Y. Excavation
200 C.Y. Borrow Pit Stripping
7,500 C.Y. Selected Borrow
500 L.F. 12" R.C. Pipe
250 L.F. 15" R.C. Pipe
120 L.F. 36" R.C. Pipe
1 Each Catch Basin
500 Lb. Castings
15,800 Gal. R.C. 1 Asphalt
15,800 Gal. R.C. 2 Asphalt
650 Tons Slag Chips
650 Tons Crushed Chips
275 C.Y. Bank Run Material

CONTRACT 1016
Federal Aid Project S-157 (3)
Milton to Overbrook
Sussex County
Stabilized Earth and Surface Treated 4.376 Miles

1.35 A. Clearing
1.15 A. Grubbing
22,000 C.Y. Excavation
45 C.Y. Structure Excavation
10,000 C.Y. Borrow
200 C.Y. Borrow Pit Stripping
12,000 C.Y. Selected Borrow
31 C.Y. Cement Concrete Masonry
1,450 Lb. Reinforcing Steel
450 L.F. 12" R.C. Pipe
623 L.F. 15" R.C. Pipe
55 L.F. 24" R.C. Pipe
60 L.F. 36" R. C. Pipe
95 L.F. 8" Corr. Metal Pipe
5 M.Ft. Sheet Piles
82 L.F. Cement Concrete Curb
1,300 L.F. Wood Shoulder Curb
1,300 L.F. Wire Rope Guard Rail
12 Each End Post Attachments
250 S.Y. Sodding
27,000 Gal. R.C. 1 Asphalt
27,000 Gal. R.C. 3 Asphalt
1,100 Tons Slag Chips
1,100 Tons Crushed Chips
2,500 C.Y. Bank Run Material

CONTRACT 1030
Federal Aid Project F-113 (3)

OFFICIAL PROPOSALS

Charles W. Cullen Bridge
Indian River Inlet
Sussex County
Concrete and Steel Deck Structure
0.131 Miles

92 M.Ft. Creo. Timber Structures
1,476 C.Y. C.C. Masonry, Piers
174 C.Y. C.C. Masonry, Slab
398 L.F. C.C. Handrail
65,000 Lb. Reinforcing Steel
427,000 Lb. Structural Steel
784 Each Shear Lugs
Painting Existing Metalwork
20,800 L.F. Creo. Timber Fender Piles
8,000 L.F. Furnishing Steel Piles
6,700 L.F. Driving Steel Piles
91 Each Steel Pile Splices
1 Each Pile Loading Test
287,000 Lb. Steel Sheet Piles
500 Tons Rip-Rap
175 L.F. Wrought Iron Handrail
Diver Service
Removal Concrete at Pier 16C
Removal of Existing Structure
5 Each Removal Broken Piles
Repairs to N. Approach
Alterations to Swing Span
4 Each Ties for S. Jetty
Electrical Equipment

These contracts are Federal Aid Projects and will come under the provisions of the Federal Aid Highway Act as amended.

The Employment Agency for these contracts shall be the Delaware State Employment Service whose offices are located at 601 Shipley Street, Wilmington, Delaware; 307 S. State Street, Dover, and the Wagamon Building, The Circle, Georgetown, Delaware.

Attention is called to the Special Provisions in the proposal, specifications and contract agreement.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed as specified.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check, or money to the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked "Proposal for the construction of State Highway Contract No. ....."

The right is reserved to reject any or all bids.

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

Complete sets of plans and specifications may be obtained after June 20, 1949, upon receipt of five dollars ($5.00) for each contract, which amount will not be refunded.

Make checks payable to the State Highway Department.

STATE HIGHWAY DEPARTMENT
By: J. Gordon Smith, Chairman
W. A. McWilliams, Chief Engineer.
Dover, Delaware
June 8, 1949.

(Continued on page 128)

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal Advertising is $1.00 per line (or fraction) per insertion.

COPY RECEIVED: up to 3:00 P.M. Friday for issue out following Thursday subject to space open for last minute ads.

SEND COPY: to Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

OFFICIAL PROPOSALS
(Continued from page 127)

Bids: August 8, 1949 (194)

Construction of Refuse Incinerator

CORPORATION NOTICE
CITY OF YONKERS

PROPOSALS FOR THE CONSTRUCTION OF REFUSE INCINERATOR FOR THE CITY OF YONKERS, NEW YORK, AS PER PLANS AND SPECIFICATIONS.

Office of the
Board of Contract and Supply
Yonkers, New York June 8th, 1949.

Pursuant to Special Ordinance No. 209, 1948 and Special Ordinance No. 98, 1949, sealed Proposals will be received at the Office of the Secretary of the Board of Contract and Supply, City Hall, Yonkers, New York, after 2:00 o'clock P. M. (EASTERN DAYLIGHT SAVING TIME) on August 8th, 1949 and until 2:00 o'clock P. M. (EASTERN DAYLIGHT SAVING TIME) on August 10th, 1949.

Copies of Information for Bidders, Form of Proposal, Form of Contract, Drawings, and Specifications for the aforesaid work may be obtained at the Office of the Board of Contract and Supply and at the Office of Metcalf & Eddy, Engineers, 1300 Statler Building, Boston, Mass., and only bids made upon said forms will be accepted. Copies may be obtained upon deposit of $50.00 (CASH OR CERTIFIED CHECK) which will be refunded to each bidder who bids, or returns the Specifications unused, within Thirty (30) days after the opening of bids.

When such improvement shall have been completed, the whole expense thereof shall be borne by the City at Large, payable from the proceeds of a sale of bonds of the City, hereafter to be authorized.

Dated: June 8th, 1949.
FRANK VAN BLARCOM
Secretary of the Board of Contract and Supply

U. S. Government

North Platte Project

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NOTICE IS HEREBY GIVEN that sealed bids will be received at Casper, Wyoming, until 10 a.m., Mountain Standard Time, June 28, 1949, and then publicly opened, for furnishing labor and materials and performing all work for the earthwork, lateral lining, and construction of structures on Laterals 29.4 and 90.4, Fort Laramie Canal; Rehabilitation of Existing Laterals, North Platte Project, Nebraska-Wyoming. The work on Lateral 29.4 is situated near Lingle, Wyoming, and the work on Lateral 90.4 is situated near Lyman, Nebraska.

The principal items of work to be done under these specifications involve earthwork; removing existing structures and constructing new structures, including the laying of a 30-inch O.D. welded-steel-plate pipe flume; and placing unreinforced concrete or pneumatically applied mortar lining.

Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: L. N. McClellan, Chief Engineer, Building 1-A, Denver Federal Center, Denver, Colorado; A. A. Batson, Regional Director, New Customhouse, Denver, Colorado; and L. J. Matthews, District Manager, Casper, Wyoming. The specifications will consist of two volumes, "Special Provisions" and "Standard Specifications for Construction of Canal Systems, March 1949." No charge will be made to prospective bidders for copies of the Standard Specifications or for copies of the Special Provisions; to others the charge will be $0.30 per copy for the Standard Specifications and $0.25 per copy for the Special Provisions, not returnable. (207)

(Continued on page 143)

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.20 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.00 a line an insertion.

INFORMATION.
BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:
The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

NEW ADVERTISEMENTS received by June 27th appear in July 7th issue subject to limitation of space available

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—ENGINEERS. Architects, Draftsmen experienced in the design of sewers, sewage treatment plants, water treatment plants and industrial buildings. Also engineers to supervise construction. State qualifications, experience, salary requirements and date available. P-3155, Engineering News-Record.

WANTED: THOROUGHLY experienced estimator for building contractor specializing in public works. Stanley W. Newman Co., Inc., Mobile, Ala.

STRUCTURAL DESIGNERS and draftsmen experienced in bridge work. Middle Atlantic location. Permanent positions for qualified men. P-9053, Engineering News-Record.

HIGHWAY ENGINEER, graduate civil, 30 to 45 with at least 5 years experience in highway design or construction. Concrete pavement experience essential and soils experience desirable. Must be able to write good technical reports. Permanent position with ample opportunity for advancement. Salary $350 to $450 depending on age and experience. Location Chicago with some traveling. P-9099, Engineering News-Record.

WANTED: THOROUGHLY experienced Structural Engineers, Architectural Engineers, High Pressure Piping Engineers and Draftsmen qualified for work on drafting board for design of steam-electric power plants, water and sewage treatment plants. Also experience field engineer qualified to lay-out, check and supervise construction of above. Location southeastern states. State qualifications, references, salary required and earliest date available. P-9123, Engineering News-Record.

RIGGER FOREMAN, experienced in rigging for driving extra long steel H-Piling for building foundation. State age, experience in full, and all pertinent information. Job located in northern New York state. P-9129, Engineering News-Record.

CIVIL ENGINEER WANTED

Established General Contractor in Northeast Florida needs Graduate Civil Engineer, with experience in estimating and handling construction and remodeling of commercial buildings. Preferably between ages 30 to 45. Furnish complete record.

All replies confidential.

P-9242, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

POSITIONS VACANT

WANTED: INSTRUCTOR or Assistant in Structural Engineering. Professional experience desirable but not required. Salary range $3500 to $4200 for eleven months. Write or call Prof. R. C. Harris, Penn College, Cleveland 15, Ohio.

WANTED: ENGINEER-Estimator experienced in excavations, foundations and underpinning work. For work in New York City only. Give complete experience record and references. P-9182, Engineering News-Record.

SALES ENGINEER: 25-40, to make inspections, estimates, close and follow jobs in field. Highly specialized work—thorough training furnished by us. Traveling essential. Headquarters New York area. P-9175, Engineering News-Record.

WANTED: ESTIMATOR for Heating, Plumbing, Air-Conditioning Contractor located in Central Pennsylvania. State age, qualifications, experience, and salary expected in first letter. P-9176, Engineering News-Record.

GRADING FOREMAN. Must be able to interpret road plans and stakes, set finish stakes, take charge of job. First letter state age, experience, references, salary required. P. O. Box 482, Grand Forks, North Dakota.

(Continued on page 129)

Chemist Position Vacant

Position as Chemist vacant in Water Department in large southern city. Modern rapid sand filter plant, reservoir water—soft. Write care of this magazine, giving full particulars as to training and experience, salary expected, as well as personal information.

P-9149, Engineering News-Record
330 W. 42nd Street, New York 18, N. Y.

DISTRIBUTORSHIP WANTED

Sales Engineer with fifteen years experience, now organizing own business in southern New England, interested in securing distributorship for construction or materials handling equipment.

RW-9168, Engineering News-Record
330 W. 42nd Street, New York 18, N. Y.

MECHANICAL ENGINEER

For immediate, permanent employment in Architect-Engineer's office to work as mechanical superintendent on building structures.

LEO A. DALY COMPANY
633 Ins. Bldg., Omaha, Nebr.

SEARCHLIGHT SECTION

DISTRIBUTOR
WANTED

Established manufacturer of nationally advertised waterproofing and other compounds for concrete seeks individual or organization to distribute its products in promising territories such as some midwestern States, Utah, Georgia, Virginia, Alaska, Canada. Knowledge of construction and ability to sell most essential. Personal contacts with Architects, Engineers and Industrials a requisite. Please give complete details as to experience and contacts. Replies confidential. Write:

RW-9211, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

POSITIONS VACANT

ENGINEER, CIVIL, experienced in drafting, quantity estimating, field layout work and supervision for general contractor. Write P. O. Box 755, Langley Field, Va.

FOR CENTRAL & Northern New York State: Bricklayer Foreman capable of handling brick and stone work on large project, ready to start in four to six weeks. Answer in own handwriting stating age, background, character and experience, references, and following, if any. P-9188, Engineering News-Record.

WANTED BY Up-state New York Building Contractor. Man experienced in purchasing, expediting, handling of sub-contractors and dealing with Architects. Give experience and references. P-9132, Engineering News-Record.

FIRST CLASS structural detailer-checker. Location East. Top rate. State age, availability, experience in first letter. P-9223, Engineering News-Record.

WANTED MAN with knowledge of Gunite Cement Machine operation. One who can also estimate as well as apply work. Have a good proposition for the right party. Salary and a chance to share in the profits. Norwalk, Conn. 6-1651. Evenings Norwalk 6-9870, Mr. Bisse. Will consider selling machine also.

WANTED: SANITARY Engineer experienced in the desing of sewage and water treatment plants. State experience, salary, and availability. Continuous employment if satisfactory. Location Gloversville, New York. Morrell Vrooman Engineers.

WANTED CONSTRUCTION Superintendent for NYC Public School Extension ($5000.00). Thoroughly experienced. Send refecences and state age and salary in first letter. P-9258, Engineering News-Record.

POSITIONS WANTED

PROJECT MANAGER or General Superintendent. Available July 1st. Over 25 years diversified experience foreign and domestic work. Outstanding record on reorganization of delayed projects and in over-all management supervising all departments. Highest references. PW-9253, Engineering News-Record.

FORMER REGULAR Army Engineer Colonel, age 36, desires permanent position with general contractors or oil industry. Considerable heavy construction experience in U. S. and tropics. Complete history furnished on request. PW-9037, Engineering News-Record.

QUARRY MANAGER. Eng. graduate, 16 years experience in all phases of crushed stone industries. PW-9255, Engineering News-Record.

HAVE JUST completed preliminary research, layout, design and construction of large light weight aggregate plant in middle West. Desire similar connection. Graduate registered mechanical and electrical engineer with broad experience in production management. PW-9265, Engineering News-Record.

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (39 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N.Y.

POSITIONS WANTED

GENERAL SUPERINTENDENT, 50, of the highest grade available for concern doing major heavy work, bridges, foundations and marine structures. Excellent references. Address PW-9038, Engineering News-Record.

TOP FLIGHT Construction Executive has C.E. and L.L.B. degrees. Many years with pre-war background as Construction Superintendent industrial plant and commercial buildings of large magnitude. Low cost producer and fast completions. Well recommended. Address PW-9039, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 27 years experience in complete charge of projects consisting of: chemical plants; slip-form concrete structures; material handling and process equipment installations; grain elevators and dryers; cement plants. Under fifty years of age. Will go any location. Further details on interview. PW-8914, Engineering News-Record.

STRUCTURAL ENGINEER, registered wants to take work in contract. Thoroughly experienced in design of bridges and other heavy construction. Large or small contracts efficiently handled. PW-9082, Engineering News-Record.

SUPERINTENDENT WATER works or Sewage Plant. Extensive experience in operation and maintenance of plants, distribution systems and collection systems. Especially successful in chemical treatments, filtration improvements, improvement of distribution systems, chemical, physical and bacteriological examinations of all types of waters. Education, B.S. in Chemical Engineering with 12 years of active experience with plants of all sizes. Interested only in positions where water works or sewage properties are to be operated and maintained properly. PW-9265, Engineering News-Record.

CONTRACTORS SUPERINTENDENT engineer, P.E. license New Jersey, 42 years of age, 20 years experience with contractors including highway, railway, airfield, sewage and industrial building construction. General excavation and drainage. Also one year foreign contract on road reconstruction. Desire employment on permanent basis. Relocate. Will accept out-of-country assignment. PW-9236, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, age 40; 15 years experience as superintendent on open cuts, tunnels, disposal plants, pumping stations, coffer dams, conduit lines, etc. Can figure jobs, knows cost, excellent references. PW-9231, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT. Piping process equipment, age 38, 20 years experience heavy construction, foreign or domestic. Available June 15. PW-9219, Engineering News-Record.

CONSTRUCTION SUPT. 25 years experience municipal, industrial and commercial projects. Anywhere. $150 week. Further details on interview. PW-9254, Engineering News-Record.

CIVIL ENGINEER, Cornell graduate, married, age 28, postgraduate work in indeterminate structures. Experience RR track planning and layout; oil refinery construction, equipment layout and pipe sketching. Desires position with contractor for field and office work. Available 2 weeks' notice. Locate anywhere. PW-9213, Engineering News-Record.

(Continued on page 130)

SALES MANAGER
AVAILABLE

Construction, mining, and industrial equipment. Twenty-one years complete experience engineering, contracting, distributing, and manufacturing. Civil engineer, age 42, excellent health. Domestic or foreign. Location and contact open.

PW-9105, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

GENERAL SUPERINTENDENT
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(Continued from page 129)

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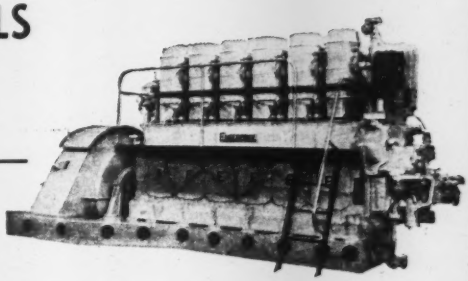

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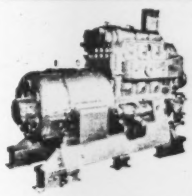

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(Continued from page 128)

Bids: July 11, 1949 (215)

Foundations for Primary Sub-Station

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-94

Sealed proposals for the construction of foundations for the primary sub-stations at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, N. Y., until 2:00 P.M. Monday, July 11, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:30 P.M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer, and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, June 23, 1949.

Bids: July 5, 1949 (217)

Reconstruction and Repairs of Sewers, Catch Basins, Curbs, Gutters, etc.

Notice is hereby given that sealed proposals will be received by the undersigned City Clerk of the City of Cudahy, Wisconsin in his office until Tuesday, July 5, 1949, at 8:00 P.M., at which time bids will be opened publicly and read for furnishing all the material and doing all the work necessary for the Reconstruction and/or repair of an existing Combined Sewer in S. Packard, E. Holmes and S. Kirkwood Avenues. Also the removal and replacement of such pavement, curb and gutter, catch basins, laterals, etc., as may be required. Work involves the following:

Combined Sewer: 586 lin. ft. Relay of 24 inch; 128 lin. ft. Relay of 30 inch; 828 lin. ft. Repair of 30 inch; 1,125 lin. ft. Repair of 36 inch; 1,450 lin. ft. Repair of 48 inch.

Repairs to be bid on clay liner plates or "Gunite" lining.

3 each catch basins; 50 lin. ft. 8 inch catch basin laterals; 684 lin. ft. curb and gutter; 470 sq. yds., 9 inch Concrete Pavement.

All in the City of Cudahy, Wisconsin.

Plans and specifications may be obtained from the City Engineer, 3555 E. Pabst Ave., Cudahy, Wisconsin by depositing five dollars ($5.00) for each set. Deposit will be refunded upon the return of the plans within thirty (30) days of the opening of bids.

The Common Council reserves the right to reject any or all bids and to waive any informalities in bidding.

No bid shall be withdrawn after the opening of bids without the consent of the Common Council for a period of thirty (30) days after the scheduled time.

A certified check or bank draft payable to the City Treasurer, or satisfactory bid bond, in an amount not less than 5 per cent of the bid shall accompany each bid as a guarantee that if the bid is accepted, the bidder will execute and file the proposed contract and bond within ten (10) days after the award of the contract.

Bidder shall state the number of days for completion.

Published by the authority of the Common Council of the City of Cudahy, Wisconsin, June 7, 1949.

JAMES F. KELLER,
City Clerk

U. S. Government

Federal Works Agency, Public Buildings Administration, Washington, D. C., June 7, 1949.—On or about June 29, 1949 bidding material for construction (except elevators) of the superstructure of the Clinical Center (Building No. 10) at the National Institutes of Health, at Bethesda, Maryland, will be available for distribution to general contractors by this office. Applications from general contractors interested in bidding on this work, for not to exceed 3 sets of drawings and specifications, should be filed promptly with this office and the bidding material will be forwarded as soon as available. Bids will be opened on Aug. 23, 1949. Bidding material will be available at Room No. 507 Lemon Building, 1729 New York Ave., N. W., Washington 25, D. C., Phone EXecutive 4900, Extension 2397. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency. (214)

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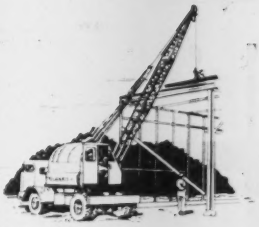
"Speaking of truck shovels.....
Why did you buy a MICHIGAN?"

"Because it Moves Dirt FAST!

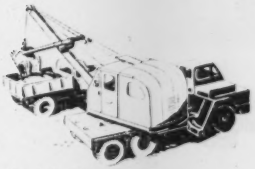
It's *yardage* that counts! And my MICHIGAN has convinced me that you don't always need a big dipper to get big yardage. No matter what I put her on—sand, gravel, clay, rock—that baby *really* goes to town! Gets out more yardage per hour than any shovel that size I've ever owned. She crowds and swings fast, and dumps fast and clean. When anyone says truck shovels to *me*, I say, 'my *next* one's a MICHIGAN, too!' For the best 'buy' in a truck shovel, get a MICHIGAN!"

Write for Bulletin 100—
"On the Job With MICHIGAN"

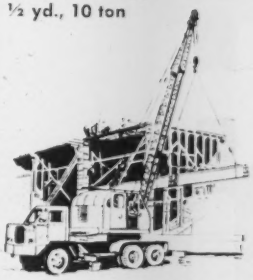
DID YOU KNOW
you can buy
a brand new
MICHIGAN
TRUCK CRANE
complete with
chassis for as
little as $10,250
F.O.B. factory?



Model T6K
⅜ yd., 6 ton

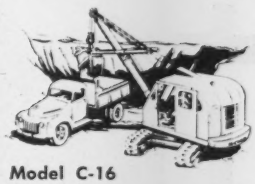


Model TMDT-16
½ yd., 10 ton



Model TLDT-20
12 ton

Series 8
½ yd., 8 ton



Model C-16
½ yd., 8 ton

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
500 SECOND STREET, BENTON HARBOR, MICHIGAN, U.S.A.

50th birthday of the company whose products you know by the trade-mark: TIMKEN

SINCE 1899 THE TIMKEN ROLLER BEARING COMPANY HAS BEEN HELPING AMERICAN INDUSTRY GET THE MOST FOR ITS MONEY

NOBODY likes to buy a "pig in a poke". In America you don't have to. You're protected by trade-marks like "TIMKEN".

Registered as a trade-mark in the United States Patent Office, "TIMKEN" identifies products made by The Timken Roller Bearing Company: Timken tapered roller bearings, Timken alloy steels and seamless tubing and Timken removable rock bits.

Experience over the years has shown Timken products to be the finest in their respective fields. And many thousands of men and women are working hard to keep them that way. No wonder it has become a habit throughout industry to look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".